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ST APPLICATIONS

The Magazine for Users of Atari ST, STE, Falcon and TT Computers

Issue No. 27, March 1993

THIS MONTH

Reviews

- Warp 9
- XBoot III
- DeskJet 550C

Articles

- PostScript Part 2
- Music Scores
- DSP Fundamentals
- DTP on the ST
- Advanced ST Programming
- Beginners' Forum
- Superbase Tutorial

Regulars

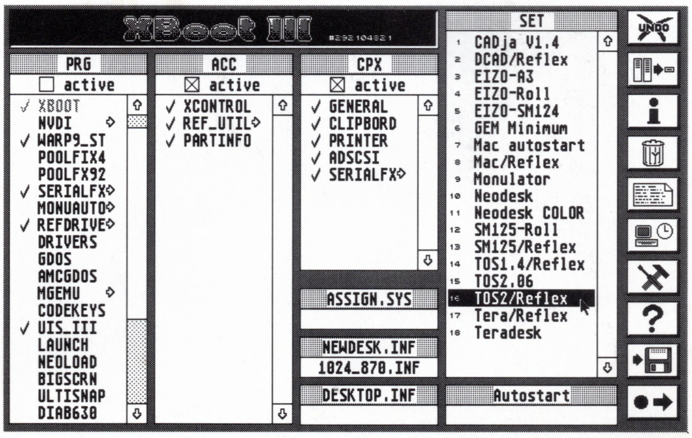
- News
- CAD Column
- STicks and STones
- Desktop Discussions
- Programmers' Forum
- Going On-Line
- Forum
- Grafix Arts

Printed in the U.K.

Warp 9

The new screen accelerator from Codehead Technologies is a re-vamp of the popular Quick ST. Mark Baines reviews the new features in this month's issue.

XBOOT 3


XBoot III
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PRG
☐ active
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NVDI ⇨
✓ WARP9_ST
POOLFIX4
POOLFX92
✓ SERIALFX⇨
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Autostart
UNDO
?

Joe Connor reviews the upgrade to XBoot 2 (which was compared to Superboot in issue 9), and finds that the new features are not mere fluff. These include file linking, a new Sort screen, default sets, setting up a large screen monitor mode, and Batch commands.

Two New Series

Beginners' Forum

Mark Baines starts a new column where readers can seek assistance with their general computing problems. This month he takes a look at an old chestnut: Printer Drivers.

DTP

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DTP
S
P

Günter Minnerup starts a series on professional-quality desktop publishing on the Atari ST. The articles will not be based on any specific DTP package, but rather will have as their aim the inculcation of the general principles of good design, as exemplified by a real-life project: a set of stationery for a small business.

The Compleat Swiss ...

Albanian Afrikaans Amharic Armenian Arabic Assamese Azeri Bihari Byelorussian Chinese Chuang Czech Danish Dzongkha English Esperanto Estonian Farsi Finnish French German Georgian Greek Gujarati Hebrew Hindi Hiragana Hungarian Icelandic Irish Italian Kanji Kashmiri Katekana Kazakh Khasi Kirghiz Kurdish Ladakhi Latvian Lithuanian Malaysian Manipuri Marathi Mizo Moldavian Mongolian Naga Nepali Norwegian Old Cyrillic Oromo Polish Portuguese Punjabi Pushto Rajasthani Russian Sanskrit Serbian Serbo-Croat Sindhi Slovene Slovak Spanish Swedish Tajik Tamil Tibetan Tigrinia Turkmen Uighur Ukranian Urdu Uzbek Vedic and more

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CREDITS

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Contributors:

Mark Baines Revd. Joe Clemson
Joe Connor Peter Crush
Jon Ellis William Hern
Paul Keller Günter Minnerup
Andy Pennell

Contributions

The articles in *ST Applications* are written by users for users. Everyone reading this magazine will have something to contribute; even if you do not feel able to do a full-length review or article there is the Forum section for short hints, tips and questions. If you are interested in writing for *ST Applications* - regularly or irregularly - please write for a copy of our terms and conditions. We always do our best to reward quality work with appropriate remuneration.

Epilepsy Scare Explained

Recent misleading reports in the tabloid press have been causing concern amongst parents. The reports were sparked off by the tragic death of a youngster caused by an epileptic seizure whilst playing a computer game. The British Epilepsy Association's response was that "The current public anxiety about epilepsy and video games is misplaced. This reflects the lack of public understanding about epilepsy". The following will, I hope, clear up any misunderstandings on this emotive issue.

Epilepsy affects less than 1% of the population. A rare condition known as photosensitive epilepsy occurs in 3-5% of epilepsy sufferers. Those who suffer from this condition can have a seizure brought on by flickering light or other visual stimulation. This can be caused by the flickering of a television screen but more obscure things, such as disco lights and the slow down lines painted on the approach to certain roundabouts, are also known to have had the same effect in certain circumstances.

It must be noted that neither the television (or monitor) nor anything being displayed on it can cause epilepsy. It can however, trigger a seizure if the person already suffers from the prescribed condition. It is correct to assume that the same problem can occur when watching a television programme, as well as playing a computer game. It must be pointed out that it is very rare for a seizure to be brought on by the flickering from a television set, even in those who suffer from the condition. A hand held game is unlikely to cause any problems because it uses different technology from that of a television or monitor.

Parents whose children suffer from epilepsy and are concerned about a possible seizure being brought on by a television set are advised to follow these guidelines. Ensure that your child sits at least 2.5 metres (about 8 feet) away from the television screen. Never have the brightness at its maximum and use a screen measuring 14 inches or less. If you think your child may be suffering from this condition, it is advised that you consult your GP with regard to having the relevant tests carried out.

Most of the above information was taken from any article by Dr Cliff McKnight of the HUSAT Research Institute at Loughborough University which was published by the Europress Group. Dr McKnight was himself a sufferer of photosensitive epilepsy in his youth. Further information may be obtained from The British Epilepsy Association on 0345 089599.

Piracy Latest

Following the recent agreement by ELSPA members that a single ELSPA official is empowered to seize all pirated software belonging to affiliated members during a raid (see ST Applications issue 25), three successful raids have already taken place, netting around £740,000 of illegal software.

The first raid was on the Cross Green market in Leeds where over £250,000 worth of counterfeit software was seized. Five people have been charged and released on bail. The market in question has long been known to have been rife with software pirates. The raid was carried out by local Trading Standards Officers and the five are expected to face heavy fines.

The second raid was on a stall at the Barrowlands market in Glasgow. Many of you will remember news items on previous raids there over a year ago. This time it was carried out by a private detective accompanied by three bodyguards and three policemen. About 3,500 disks and two Amigas were removed. No information was given on arrests. The piracy situation in Glasgow has deteriorated so much in recent years that there is only one retailer, Virgin Games, stocking computer games in the entire city!

The first raid of the New Year was a return visit to Glasgow and netted a record £400,000 worth of counterfeit software. A total of five stalls were closed down and 5,000 disks were taken. More raids are planned both for the Barrowlands and elsewhere in the country in the coming months.

ELSPA's latest move against the pirates involves empowering retailers to seize illegal software themselves. FAST are issuing certificates on behalf of ELSPA which will empower individual software dealers to seize counterfeit software being sold in a public place such as a car boot sale. Any retailers wishing to participate should contact John Loder at FAST on 0628 66037.

Read_Me 1st

Subscription Expired? If you received this copy of *ST Applications* through the post, check the first line of your address label carefully: if it reads **STA27**, then your subscription has expired with this issue; if the information line reads "Complimentary Copy" you have been sent a free evaluation copy of *ST Applications*. Either way, you must take out a new subscription in order to receive further issues.

Information

Editor:	Paul Glover
Sub-Editor:	Nicky Wilson
Layout:	David Smith
News Editor:	Steve Delaney

Published by: The ST Club
2 Broadway
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Fax: 0602 241515

Advertising

There is a limited amount of space for commercial advertising in each issue of *ST Applications*. Contact Nicky Wilson on 0602-410241 for further details and to request a media-pack. Subscribers can place free classified advertisements - see page 57 for details.

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Canadian office: Tel: 519 539 0200; Fax: 519 539 9725.

Contact us for details of your nearest *ST Applications* stockist.

Disk Mags

These are bi-monthly compilations of the best PD software to come to our attention in the preceding couple of months - not magazines on disk. The next Disk Mag, DMG.34, will be dispatched a few days after issue 28 is sent out.

A Fair Line Up!

The year has hardly begun and the computer show line up has been announced! The All Formats Fairs, Midi And Electronic Music Show and International Computer Show all have events in the first quarter and Future Publishing have announced a follow-up to the Future Entertainment Show at Olympia next October. The dates to mark in your diary are as follows:-

19-21 February - 7th International Computer Show, Wembley Exhibition Centre, London.
20 February - All Formats Fair, Haydock Park Racecourse (J32, M6)
21 February - All Formats Fair, City Hall, Candleriggs, Glasgow (Off M8).
27 February - All Formats Fair, Dacorum Pavillion, The Marlowes, Hemel Hempstead.
28 February - All Formats Fair, Brunel Centre, Templemeads, Bristol (M32).
7 March - All Formats Fair, University Sports Centre, Calverley Street, Leeds (End M1).
20 March - All Formats Fair, Sandown Park, Esher, Surrey (J9/10, M25).
25-28 March - Ideal Computer Games Show, inside the Ideal Homes Exhibition, Earls Court, London.
27 March - All Formats Fair, Haydock Park Racecourse (J32, M6)
4 April - All Formats Fair, City Hall, Candleriggs, Glasgow (Off M8).
18 April - All Formats Fair, National Motorcycle Museum, Birmingham (J6, M42).
23-25 April - The Fourth Midi And Electronic Show, Wembley Conference & Exhibition Centre, London.
24 April - All Formats Fair, Sandown Park, Esher, Surrey (J9/10, M25).
25 April - All Formats Fair, Brunel Centre, Templemeads, Bristol (M32).

For further details on any of the above events contact the following:-

All Formats Fairs - Bruce Everiss, Tel: (0608) 662212
Midi And Electronic Music Show - Emma Harrison/Lorna Hemmings, Westminster Exhibitions, Tel: (081) 5699768
International Computer Show - Westminster Exhibitions, Tel: (081) 5493444; Fax: (081) 5471311.
Future Entertainment Show - Tony Keefe/David Cunningham, Future Publishing, Tel: (0225) 442244; Fax: (0225) 465982.

DA's Vektor

DA's Vektor is a colour graphics program which runs on any ST, STE or Falcon with at least 2 Megabytes of memory. It requires a minimum screen resolution of 640x400 pixels and will handle anything from 2 to 16.7 million colours, being compatible with most graphic boards. It features a vector graphics editor which allows fill patterns to be created with half tone or colour pictures and objects to be created with straight lines or bezier curves. The objects can be scaled, rotated or projected onto 3D bezier surfaces and mathematically transformed using the integrated calculator.

Extensive control over text is possible with the ability to justify text, create circular text, create multiple lines of text and even make text follow any vector path. You can use Postscript type 1 fonts or Calamus fonts. An auto trace facility is included, which can automatically vectorise half tone or colour pictures of any size. DA's Vector can also create pie charts, 2D or 3D bar charts or self-defined vector objects.

The package also includes includes a vector animator which is particularly well suited to video titling. A player program is provided so that your animations may be freely distributed. The program uses an on-line manual and tutorial which can be called up at any time from within the program. DA's Vector imports and exports CVG, GEM, Didot VG and EPS (export only) and includes a graphic converter which handles IMG, DEGAS, TIFF and others. It is available now at a cost of £149 from GCS ComputerBild, 19 Ledbury Place, Croydon, Surrey CR0 1ET; Tel: (081) 666 8121; Fax: (081) 666 0405.

News In Brief

Fun School goes Stateside

The entire Fun School range of educational software is to be made widely available in The States thanks to a distribution deal between Eurporess Software and Davidson Associates. The deal is the result of nine months' negotiations between the two companies.

MIDI Show News

Over 150 exhibitors have already booked stand space for the forthcoming MIDI and Electronic Music Show, some from as far afield as The States. Seminars will be given by Roland, Yamaha, Akai, Fostex and others. Guest appearances are being made by Charlie Morgan (Elton John's drummer) and Joe Hubbard who will be demonstrating MIDI drumming and MIDI bass techniques respectively. The 4th Midi and Electronic Music Show will take place at Wembley Conference and Exhibition Centre from 23rd to 25th April. For further details contact Emma Harrison or Lorna Hemmings at Westminster Exhibitions; Tel: (081) 5699768.

High Res monitors from Gasteiner

Because of the current shortage of Atari monochrome monitors, Gasteiner Techology have recently introduced a 14" monochrome monitor (fitted with an FSQ tube) which is a direct replacement for Atari's SM144. The GM-148 has a screen resolution of 640x400, runs at 71.41 Hz and has the Atari 13 pin DIN monitor plug fitted as standard. It claims to give the same picture quality as the old SM124 and SM125 monitors but with the added advantage that it has a larger screen area (14" as opposed to 12"). It is compatible with the entire ST range and can be used on a Falcon with the appropriate video adaptor block. The GM-148 costs £149 including VAT, delivery is extra. Contact Gasteiner Technology Ltd on 081 365 1151.

Z*NET is back

Z*Net, the popular on-line magazine from The States is back. It merged with Atari Explorer Magazine last year to form Atari Explorer On-Line, with Z*Net editor Ron Kovacs in the editor's hot seat. After less than a year, Ron has left AEO and resumed publication of Z*Net. The good news is that AEO is to continue under a new editor, so now we have two first class on-line magazines where this time last year we had one.

Virtual Vision on a TT

A new video presentation system has been developed by Virtual Vision, a division of PSI PLC, running on an Atari TT programmed in GFA Basic. It was first demonstrated at the Victoria and Albert Museum in January. The system runs at 125 events per second on a 35 foot virtual screen and has four dimensional sound capability. The presentation was titled 'The Olympic Flame' and showed clips of the greatest olympic stars in a new virtual experience. Apart from the TT, the other key component of the system is a Sony CRV recordable laser disc system. For further information on this exciting new presentation system contact Virtual Vision, 7-11 Kensington High Street, London W8 5NP; Tel: (071) 937 9801; Fax: (071) 581 4445.

BBS Moves

With effect from 1st February, STatic BBS has a new Sysop and a new location (Edinburgh). Regular callers wishing to keep in touch should not that their new telephone number is 031 556 9734.

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Compo News

Compo Software have recently tied up the UK distribution rights to several products in the Gribnif (publishers of NeoDesk) range. These include the popular communications package Stalker at £39.99, the mono art package Arabesque at £129 and Con Vector (a vector graphics program which auto traces and converts bit mapped images into vector graphics) at £99. Further Gribnif products such as Command Line Interface, Card File and Steno (a companion to Stalker) are to follow soon. They are also pleased to announce that That's Write 2 is finally available at a cost of £129.

Perhaps their most exciting new product is Falcon Speed, a PC emulator for the Falcon. It was first shown at the Comdex Show in The States towards the end of last year and is due to make its UK debut at the 7th International Computer Show at Wembley this month. Falcon Speed is a 16Mhz '286 which supports VGA, Super VGA and Windows 3.1. It is claimed that it will actually give the performance of a 16-20Mhz '386 with a Windows accelerator card by using the Falcon's higher bus speeds. No release date has been set. Expect the price to be under £200! A '486 version is to follow later in the year. For further information on any of these products contact Compo Software on 0480 891819.

Bournemouth Open Evening

Flushed with the success of their first "Open Evening" a year ago, the Bournemouth and Poole Atari User Group will hold a second, similar event at the Kinson Community Centre, Pelhams Park, Millhams Road, Kinson, Bournemouth at 7.45pm on Wednesday 3rd March. Once again, the evening will cover a wide range of activities, both 'serious' and leisure, and will feature a beginners' section aimed especially at those recent recruits to the ranks of ST(E) owners who are interested in gaining some idea of the full potential of their machine. Other interests which form the core of the Group's activities wiil also be on show, including MIDI, Desktop Publishing, Digitising and Programming. Entry is free. If you would like further details, contact Mike Hosking on 0202 842147.

Don't Trust This Man!

A Scottish bulletin board has been forced to close down after being 'conned' out of £280 by ABCO Computer Consultants in Florida, a company owned by Ralph F Mariano, editor of ST Report on-line magazine. The story began in April 1992 when nine UK sysops ordered US Robotics 16.8 HST DS+ modems from ABCO Computer Consultants. The head of one of the on-line networks acted as co-ordinator with each of the other sysops sending him £280. He then changed the money into US dollars and transferred it to Ralph Mariano's account.

None of the modems has ever arrived and Mr Mariano has since cut the ST Report message conference off from TurboNet owing to numerous messages from the sysops concerned, complaining about his dishonesty.

Respected educationalist Dorothy Brumleve also had a few words to say about Ralph Mariano in his own ST Report, of all places! She stated amongst other things: "Not many people know it, but Mr. Mariano was once a registered Atari developer. Atari has revoked a developer's registration in only one instance: Mr. Mariano's." She also said, "Not many people know it, but STR serves as the primary advertising vehicle for ABCO, Publisher Mariano's mail-order company. I've seen ads for ABCO in perhaps a dozen issues of Atari Interface Magazine - and in every single weekly issue of STR for half a decade. It would appear that STR succeeds in advertising ABCO; certainly there are plenty of customers discussing it up in Category 18 (Topic: Mail Order Problems)." Lloyd Pulley, who replied to the allegations, confirmed that Ralph Mariano had his developer status withdrawn.

Readers of the official Atari on-line magazine, Atari Explorer On-Line, will already be familiar with the situation. They have printed reports of others losing money by placing orders with Mr Mariano and not receiving the goods. I have read reports of a similar nature from throughout the world. Three examples being Conny Pettersson from Sweden who had his Mastercard charged twice for goods he has never received, Serge Weber from Luxembourg who ordered over $3000 of hard drives only to receive 2 empty cartridges and a burnt out Sysquest, and Don Harris from the States who bought two TTs, a hard drive and a monitor. He spent almost £4,000 on an order which he was promised within 7-10 days. Once again, he never received the order. He was given various excuses and eventually posted a full account of the episode to the main on-line networks in The States.

As a result of the Harris case, Atari Explorer On-Line contacted Atari Corporation's legal department who issued the following statement:

> *"It has come to our attention that ABCO Computer Consultants is conducting their business in a fashion that displeases some of their customers. STReport International Online Magazine and ABCO Computer Consultants are both operated by Ralph F. Mariano.*
>
> *"According to the Better Business Bureau of Northeast Florida, ABCO Computer Consultants has an 'unsatisfactory' rating due to failure to deal with customer complaints. Customers may wish to take this into account when reading STReport International Online Magazine, or deciding to do business with ABCO Computer Consultants.*
>
> *"ABCO Computer Consultants is not an authorized Atari dealer."*

My advice to anyone spending a large amount of money (over £100) on goods is to pay by credit card. If you do not receive the goods, the credit card company are legally bound to refund your money, subject to your claim being duly investigated and everything checking out. This protection only extends to purchases of £100 or more.

Halco News

Halco have recently launched Calamus S, a cut down version of Calamus SL. Essentially it offers much the same functionality as its big brother but with the following features omitted:- common spot colours, define raster settings, define colour separation settings, define layout - work area, anchor picture, convert picture type, histogram in the control line dialogue, access to the 'Use' function in the control line dialogue, set hyphenation rules, vertical text align, subsequent editing of text macros, italicise fonts, condense fonts, write direction from right to left, transparent outline and a few others. Calamus S is available now at £285 + VAT.

Demo disks of both Calamus S and SL are available. Type Art, a new Calamus font editor is due out soon. Unfortunately I have no further details on this product at the moment. For further details contact Halco Sunbury Co Ltd, Unit 4, Headley Park 9, Woodley, Reading, Berkshire RG5 4SQ; Tel: (0734) 441525; Fax: (0734) 441021.

Choosing a memory upgrade for your Atari ST?

The Xtra-RAM *Deluxe* is the answer!

Is your ST always running out of memory? Marpet Developments' Xtra-RAM *Deluxe* is the easy to fit and simple to upgrade memory expansion that you've been waiting for. With over 5,000 satisfied customers throughout the world, why consider anything less than the best? Using industry standard SIMMs (like ST^{E}s) the Xtra-RAM *Deluxe* lets you upgrade all the way to 4Mb.

Installation of the Xtra-RAM *Deluxe* couldn't be easier. Following the instructions laid out in our simple to follow manual which is written with the non-technical reader in mind, you disassemble your STF; STFM or Mega ST, plug in the Xtra-RAM *Deluxe* into two places inside your computer and reassemble it. The whole process takes around one hour and most machines will not require any soldering whatsoever.

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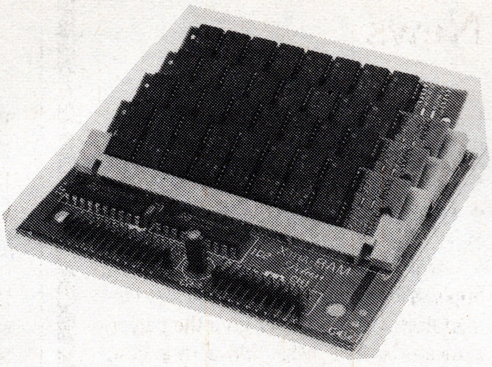

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WARP 9

Recently, the screen accelerator Warp 9 appeared on the market and Quick ST was no more. Mark Baines finds out what happened and investigates this pretender to the throne.

Quick ST has been available for some years, first as shareware then commercially, each version bringing better performance and compatibility. Last year Darek Mihocka of Branch Always sold the publishing rights and the source code of this premier screen accelerator to CodeHead Technologies, the US company that specializes in utility software. This permitted Darek to concentrate on the GEMulator and other projects and enabled CodeHead to develop it further, transforming it into Warp 9.

TOS's routines for displaying text and GEM objects on screen are not particularly optimized, especially the VDI. Quick ST was written to bypass this slow code, redirecting all screen commands to its own routines rather than those of TOS. This gave speed increases in GEM dialog drawing of over 500%, for instance. However, many other programmers also realized that GEM screen draws were slow and introduced their own performance enhancements which often conflicted with external screen accelerators, such as Quick ST. Warp 9 includes much of Quick ST's code with many of these incompatibilities and bugs removed. As a screen accelerator, not much has changed and as the table of QuickIndex speed results show, if anything Warp 9 is slower than Quick ST 3. However, if you have to switch Quick ST off to run some programs, you may now find that Warp 9 removes these restrictions.

The package

What makes Warp 9 particularly outstanding compared to Quick ST 3 (and Turbo ST) is its interface and other features. You can install Desktop pictures, replace the system font and fill patterns, have a customizable mouse accelerator with special effects and install a screen saver. Furthermore, any or all of these features can be turned on or off at any time.

The documentation is an excellent example of how to write manuals for all levels of ability and experience. Printed Release Notes are included for the v3.70 update when the EXTEND-O-SAVE modular screen saver was included and a disk README file for v3.72 update notes. The package comes on a double-sided disk.

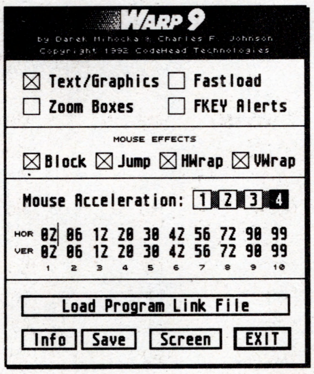
There are separate Warp 9 AUTO folder programs for the ST/STE and TT. They occupy about 68K of memory when loaded at boot up. A Control Panel accessory and a Customizer program give the user access to Warp 9's features and a separate Configuration program allows Warp 9 to be set up without loading the accessory.

Control Panel accessory

The accessory is particularly useful when lots of other AUTO programs and accessories are loaded. When it loads it sends a message to the Warp 9 AUTO program telling it to install special code making it the first to see all the system screen output calls. This, according to CodeHead, increases its efficiency giving "noticeable" and "dramatic" speed increases. Comparing Columns 8 and 9 in the table confirms a modest increase.

From the accessory you can turn the screen accelerator on or off and also the zoom boxes. Leaving zoom boxes off greatly increases the drawing speed of GEM dialogs and windows. This explains the speed increase in the GEM dialog figures in Column 5 over Column 4. An FKey Alerts button makes the first three function keys equivalent to the buttons in a standard GEM alert box, providing that the program in use doesn't use the function keys for other things.

The Mouse Effects (except for Jump) are present in the Quick ST 3 Customizer accessory. Block prevents the mouse cursor crossing into the menu bar unless the right mouse button is pressed avoiding the accidental drop-down of menus. Jump causes the mouse cursor to move immediately to the menu bar from anywhere on the screen when the right button is clicked. Obviously, both these functions can conflict with programs that use the right mouse button and CodeHead have provided a solution to this (see below). H Wrap and V Wrap are Horizontal and Vertical Wrap, where the mouse can be made to appear at the opposite side of the screen when it reaches an edge. Disconcerting at first, but useful. The Mouse Accelerator can be turned on or off or one of four settings selected. Each setting consists of a table of ten horizontal and vertical values which determine the number of pixels that are substituted for actual movements of the mouse. These can be edited so as to give linear or exponential acceleration rates.


WARP 9
by Darek Mihocka & Charles F. Johnson
Copyright 1992 CodeHead Technologies

☒ Text/Graphics ☐ Fastload
☐ Zoom Boxes ☐ FKEY Alerts

MOUSE EFFECTS
☒ Block ☒ Jump ☒ HWrap ☒ VWrap

Mouse Acceleration: 1 2 3 4

HOR 02 06 12 20 30 42 56 72 90 99
VER 02 06 12 20 30 42 56 72 90 99
1 2 3 4 5 6 7 8 9 10

Load Program Link File
Info
Save
Screen
EXIT

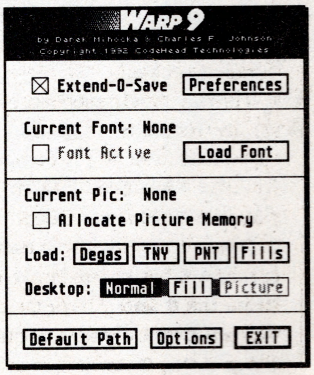
△ Figure 1. Warp 9 Control Panel Accessory showing various features selected. The Load Program Link File button enables different WARP9.DAT files to be loaded.

The Control Panel accessory allows a font to be loaded at any time even at boot up. These are in Degas format but include all 256 characters rather than the normal 128. Many examples exist on the disk for you to choose from, most of them interesting but impractical. Three possible backgrounds can be selected, Normal, Fill or Picture. The Fill pattern is determined by that set in the Customizer and a set of Fill patterns can be loaded to replace those of the system. The Picture can be in Degas, Degas Elite, Tiny or Prism Paint format. What's wrong with the GEM .IMG format? Unfortunately, memory is only reserved for the normal ST (32 K) or TT (150 K) screen sizes. This makes this facility useless in OverScan mode or when using virtual large screens or graphic cards. Even I, a modest programmer at best, know how to calculate the current screen size so why doesn't CodeHead? The fill pattern or a correctly sized .IMG file should then fill the whole screen.

The EXTEND-O-SAVE option is an extensible, modular screen saver similar to After Dark on the Mac and PC. Screen savers are programs that watch the input of a computer and, after a period of inactivity, prevent pixels from burning into the screen by changing the display, whilst preserving the original screen in a buffer. CodeHead supply the necessary help files and code on the disk so that assembler programmers can create screen saver modules which link into Warp 9. These modules can be selected from the Control Panel accessory, the default being a screen inverter. Others will fade the screen, move it about, replace it with the CodeHead logo or provide a fireworks display. More will become available in time. The Timeout value and Fade Now and Don't Fade corners can be selected and the user can decide on which events will prevent the screen saver from kicking in, for instance a modem user may select the RS232 Input button so that whilst downloading files the screen won't suddenly disappear. One of the problems with all of the example modules provided is that they all assume a standard size screen again.

The Customizer

This program enables the editing of fonts and fill patterns and their loading if the accessory isn't available. As far as the fonts are concerned this is one of the most disappointing aspects of Warp 9. The font editor is barely adequate and no substitute for many others that


WARP 9
by Darek Mihocka & Charles F. Johnson
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☒ Extend-O-Save

Current Font: None
☐ Font Active

Current Pic: None
☐ Allocate Picture Memory

Load: Degas TNY PNT Fills
Desktop: Normal Fill Picture
Default Path
Options
EXIT

△ Figure 2. Warp 9 Control Panel Accessory showing the EXTEND-O-SAVE screen saver selected.

are available. In high resolution, the edit window is the wrong aspect ratio giving a squashed appearance. No 6x6 font is allowed and only one font is permitted overall which can be scaled to half size for the 8x8 font by deleting every even numbered line. This made all the examples I used unreadable which I couldn't tolerate being a constant user of this font in high resolution. Sorry, CodeHead, I'll stick to the NeoDesk FontLoader which allows individual fonts for all three sizes.

Each of the 34 system fill patterns can be edited and saved to a file which can be loaded by the accessory. This again may cause problems, but you can now change the GEM window move bar/title to a pattern like that on a Mac.

Configuration Program

When Warp 9 is fully configured with the Customizer and Control Panel, the settings are saved to a WARP9.CNF file. Later, you can free up the accessory slot and run the Configuration program instead. This reads the WARP9.CNF file and configures the Warp9 AUTO program accordingly. However, the Desktop picture, custom font and fills cannot be set like this, but these can be made available at boot up using other methods. Different .CNF files can be set up for different resolutions, the right one being automatically selected.

Further automatic control can be had by the use of a WARP9.DAT file. It is clear that many of Warp 9's features can conflict with various applications and other utilities and this can be remedied by editing the WARP9.DAT file which is an ASCII text file. For instance, you can enter A0 to turn the screen accelerator off or M2 to select the Mouse Accelerator table two setting. Entering the name of a program file will turn off the screen accelerator when that program is run. A program name can have any of the options following it, so that SIGNUM2.PRG B0 J0 will turn off the Mouse Block and Mouse Jump features in Signum2 but still make them available in other programs. The command SCRNSAVE.OFF will turn the screen saver off at boot up and MOUSEFX.OFF likewise for the Mouse Effects.

The Pinhead code (the program fastloader) is now built into Warp 9 allowing that program to be removed from the AUTO folder. This can be configured for individual programs or switched off altogether at boot up if using other methods.

Programs can be individually configured with pictures and fonts so that UNITERM.PRG pCOMMS.PI3 tANSI.FNT will display the COMMS.PI3 picture and use an ANSI font for Uniterm only. The Control Panel can load up DAT files at any time for different situations and at boot up, for different resolutions automatically.

All these features in one package is admirable and will certainly save on disk space and memory if running numerous, separate utilities to do the same things. The extensive configuration options cater for the possible incompatibility of many of these features with certain programs. Although the fonts aspect is very poor in my opinion, the use of Warp 9 fonts doesn't slow the system down as does the use of a separate program such as NeoDesk Fontload. Comparing Columns 8 and 9 with Column 7 demonstrates this. Column 7 has Warp 9 set up to use the Chicago font whereas the NeoDesk fonts are used in Columns 8 and 9. Other programs also contribute to the large loss of performance but tests have shown the NeoDesk fontloader to be the worst culprit.

QINDEX Speed Tests

Program	**None**	**TurboST**	**QST 3**	**Warp 9**	**Warp 9**	**Warp 9**	**Warp 9**	**Warp 9**	**Warp 9**
Configuration				default	Cfg 1	Cfg 1	Cfg 2	Cfg 1	Cfg 1
Warp 9 ACC				No	No	Yes	Yes	No	Yes
AUTOs/ACCs	No	No	No	No	No	No	No	Yes	Yes
QIndex:									
CPU memory	100	100	99	98	98	99	98	96	97
CPU register	100	100	100	98	98	99	98	96	97
CPU divide	100	100	99	98	98	99	98	96	97
CPU shifts	100	100	99	98	98	99	98	96	97
TOS text	110	330	342	310	314	316	314	169	216
TOS string	106	1338	1433	1403	1413	1413	1403	634	642
TOS scroll	131	136	136	135	135	136	135	132	133
GEM dialog	133	290	565	304	549	552	549	428	448
v_gtext():									
Normal	211	42	41	42	42	42	47	49	48
Bold	512	42	66	66	66	66	66	69	68
Grey	268	269	57	58	58	58	58	60	59
Italic	602	603	94	95	95	95	95	98	97
Underlined	236	237	47	48	48	48	48	50	49

Program versions are Quick ST v3.03, TurboST v1.84, Warp 9 v3.72.

Computer is Mega ST4, 8MHz, TOS 1.4, BLiTTER, Mono monitor.

v_gtext() effects supplied by Branch Always BMVGTEFF.PRG and measures the time taken to write text with attributes to the screen. The smaller the better.

Column 1 is an empty computer showing the effect of a BLiTTER chip.

Column 2 is Turbo ST Mono which doesn't have a 'zoom box off' feature. Note the slow printing of some text with attributes.

Column 3 includes Quick ST's ZOOM_OFF.PRG run from the Desktop.

Column 4 is Warp 9 with default settings (no particular configuration). Window zoom boxes are shown. The Warp 9 accessory was not loaded.

Column 5 has the configuration (previously set and saved) set with the configuration program from the Desktop.

Columns 6 and 7 have the configuration automatically set at load up by the accessory.

Warp 9 Cfg 1 consists of only having the screen accelerator on and zoom boxes off. All other features were off.

Warp 9 Cfg 2 consists of screen accelerator on, zoom boxes off, mouse accelerator on, Chicago font loaded, EXTENDO-O-SAVE on with default screen saver and all mouse effects on. Note only the slight decrease in speed.

Columns 8 and 9 have a number of AUTO programs and accessories loaded, including NeoDesk, NeoDesk Fontload, RAMPlus RAMdisk, LGS file selector and FormDoIt. Column 8 does not have the Warp 9 Control Panel accessory loaded, Column 9 does. Note the severe decrease in performance due to the extra overheads but notice how the accessory helps.

This is understandable when you realise what is going on at the operating system level and that NeoDesk is replacing all three fonts.

Unfortunately, Warp 9 is incompatible with AutoSwitch OverScan in a big way. This surprised me as Quick ST 3 works with OverScan (except in a few minor cases) very well. Warp 9, if installed in the AUTO folder after OverScan, seems compatible until you start to run programs. It appears that Warp 9 can't cope with OverScan's changes of resolution especially when a program is called up which was initialized in another resolution. I hope CodeHead look at this problem and the other assumptions on screen sizes and the atrocious font facility soon.

Summary

Points for: Fast screen accelerator, mouse accelerator, modular screen saver, mouse effects, fastload option, system font and fills replacement, Desktop picture or fill all in one package. Extensive configuration facilities. Supposedly more compatible than Quick ST 3 with non-standard software. ST, STE and TT030 compatible.

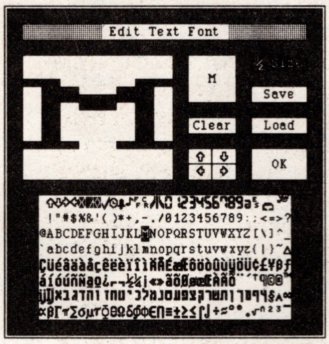
Points against: Dreadful font editor and replacement facility. Not entirely OverScan and virtual large screen/graphic card compatible. Slightly slower than Quick ST 3.

Conclusion

I am impressed with the way CodeHead have taken Quick ST and turned it from an excellent utility into a complete package offering many facilities with full configuration. The speed of Quick ST is maintained whilst improving compatibility especially with programs such as Cubase, Notator, FSMGDOS, FONTGDOS and GDOS. Those of you using replacement system fonts and who can live with Warp 9's limitations (I can't) will find a large increase in performance over having separate font loaders. The down side for me was its incompatibility with OverScan. This won't affect the majority of users but doesn't bode well for its use on the Falcon.

Alternatives

Quick ST 3 (not now available), Turbo ST (HiSoft seem to have dropped it), NVDI from System Solutions, a replacement for the whole of the TOS VDI and GDOS with almost complete compatibility.



△ Figure 3. Warp 9 Customizer program font editor. Most fonts only have the characters 33 - 127 changed. Notice that the Half-Size button is highlighted.

Product:...... Warp 9
Version: 3.72
Publisher:.......CodeHead
Technologies
PO Box 74090
Los Angeles
CA 90004
USA
Phone:............(1) 213 386 5735
FAX:..............(1) 213 386 5789
Distribution:...ST Club
2 Broadway
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NG1 1PS
Phone:............0602 410241
Price:..............£24.95 inc. VAT
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System:..........ST/STE/TT030 with any TOS in ROM; 512K RAM, all resolutions.

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	5	West Midlands	National Motorcycle Museum J6 M42
	12	London	Sandown Park, Esher, Surrey J9/10 M25
	13	Wales	Univ. Union, Park Place, Cardiff
1993			
Jan	17	West Midlands	National Motorcycle Museum J6 M42
	23	North East	Northumbria Centre, Washington, Dist. 12
	24	North	Univ. Sports Centre, Calverley St., Leeds
	30	Nottingham	Jesse Boot Centre, University
Feb	6	London	Novotel, Hammersmith
	7	Wales	Univ. Union, Park Place, Cardiff
	13	London	Sandown Park, Esher, Surrey J9/10 M25
	14	West Midlands	National Motorcycle Museum J6 M42
	20	North West	Haydock Park Racecourse J23 M6
	21	Scotland	City Hall, Candleriggs, Glasgow
	27	Hemel H/stead	Dacorum Pavilion, The Marlowes
	28	West	Brunel Centre, Templemeads, Bristol
March	6	Leicester	De Montfort Hall, Granville Road
	7	North	Univ. Sports Centre, Calverley St., Leeds
	20	London	Sandown Park, Esher, Surrey J9/10 M25
	21	West Midlands	National Motorcycle Museum J6 M42
	27	North West	Haydock Park Racecourse J23 M6
April	3	Edinburgh	Appleton Tower, George Square
	4	Scotland	City Hall, Candleriggs, Glasgow
	17	Nottingham	Jesse Boot Centre, University
	18	West Midlands	National Motorcycle Museum J6 M42
	24	London	Sandown Park, Esher, Surrey J9/10 M25
	25	West	Brunel Centre, Templemeads, Bristol
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Redacteur Lite is identical to the full Redacteur 3 package, except that it is supplied without the following modules: Sigma Equation Editor (£10), AZtheque Database (£10), Font Editor (£5), Dictionary Editor (£5), French Dictionary (£5). You may buy any of these modules along with Redacteur Lite, or later on. Prices shown in brackets.

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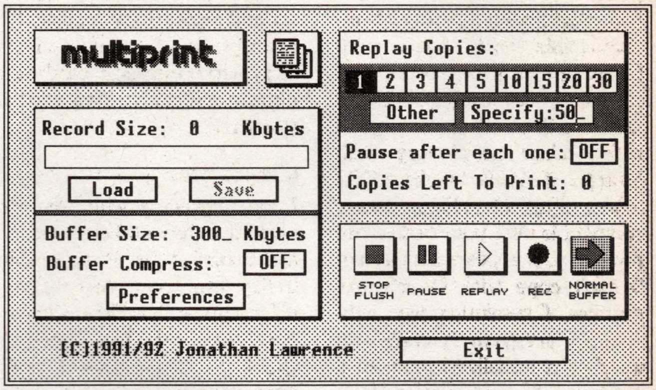
Cicero Software Group

Multiprint



Replay Copies: 1 2 3 4 5 10 15 20 30

Specify:50

Record Size: 0 Kbytes

Buffer Size: 300 Kbytes

Buffer Compress: OFF

Pause after each one: OFF

Copies Left To Print: 0

[C]1991/92 Jonathan Lawrence

Multiprint is an intelligent printer buffer that records data sent to your printer via the parallel port or serial port. Multiprint is controlled by an intuitive dialog box with VCR style buttons. Features iclude:

Replay of recorded data for high speed multi-copy printing of letterheads or leaflets.

Saving of data to printer file (*.PRN or compressed *.PCN) and loading of buffer with previously created printer file - for quick'n'easy reprinting at a later date. No need to rerun your DTP or art program.

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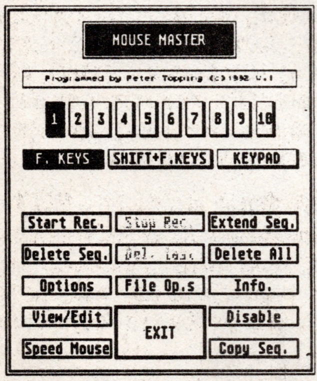
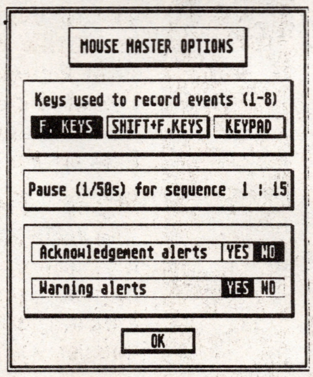
Phone (0602) 410241

Comprehensive printed manual

Mouse Master



Programmed by Peter Topping (c)1992 V.1



Keys used to record events (1-8)

Pause (1/50s) for sequence 1 : 15

Acknowledgement alerts YES **NO**

Warning alerts **YES** NO

Mouse Master allows mouse operations and commands to be recorded in the computer's memory and replayed at the touch of a key just as if you were moving the mouse. This overcomes the need to break your train of thought by stopping what you're doing and laboriously making the mouse commands which you use often. Ten different sequences of mouse instructions can be held in memory at the same time - each containing up to 100 commands, or 'events' such as clicking, double clicking and dragging.

Mouse Master can be used with any program which uses the mouse, though most of the package's facilities are available from a Desk Accessory, so it is best used with GEM based programs or the desktop.

£9.95

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C & P Rossiter

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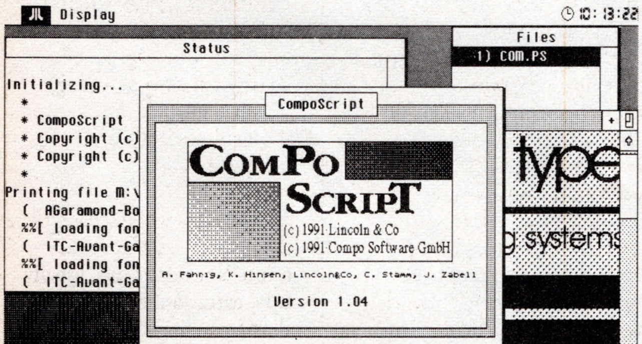
PostScript?

In part two of this introduction to the PostScript system, Michael Baxter takes a look at the facilities available to Atari users, as well as the traps and pitfalls that are waiting for the unwary...

Apart from the obvious benefits of the PostScript system, such as unrivalled support and typeface selection, Atari users are quite fortunate in that the route into PostScript printing is cheaper on their systems than any other. A reasonably powerful ST/TT setup and a software combination of PageStream 2.1 and CompoScript is all you need to play with the big boys. Coincidentally, this software combination costs nearly £150 less than Calamus SL on its own, and you get 35 PostScript Type 1 fonts, 8 SoftLogik outline fonts and 10 AGFA Compugraphic fonts to set your creative wheels in motion.

PageStream

As far as I am concerned, version 2 of this hardy package was one of the best things that has happened to the Atari DTP world. Yes, we all know about its aggravating Compugraphic printing bugs and its often intolerable screen updates, but its price/performance ratio is quite simply unmatched on any system, and its ease of use makes Calamus look cumbersome by comparison. Yet another update to PageStream is due soon (version 3?), and with the above mentioned glitches out of the way (and hopefully a little more speed via screen caching) many people will find themselves unable to justify the price difference between Calamus SL and Didot Professional. The latter is nevertheless a remarkable product, allowing paths into both the Calamus and PostScript world, but with a price tag representing its power. Both PageStream 2 and Didot have been covered in depth in previous issues of ST Applications, so I don't really need to say much more about them.



```
Status

Initializing...
  *
  * CompoScript
  * Copyright (c)
  * Copyright (c)
  *
Printing file M:\
  (  AGaramond-Bo
  %%[ loading fon
  (  ITC-Avant-Ga
  %%[ loading fon
  (  ITC-Avant-Ga
```

```
CompoScript

CompoScript
(c) 1991 Lincoln & Co
(c) 1991 Compo Software GmbH

A. Fahrig, K. Hinsen, Lincoln&Co, C. Stamm, J. Zabell

Version 1.04
```

CompoScript - if you are intending to employ the services of a bureau on a regular basis, and you don't own a PostScript laser, then this program could pay for itself in a very short space of time.

On the other hand, unless you own a PostScript laser printer, CompoScript is a very useful sidekick to both of them. Indeed, if you are going to be employing the services of a bureau on a regular basis, then CompoScript could well save you a lot of heartache. Since bureaus tend to charge by the hour (or half an hour if you are lucky) any mistakes or inconsistencies are best rectified in your own home or office via proof copies run off on an inkjet or laser printer. You may be wondering why CompoScript is needed since it only prints out files created by other software. Both PageStream and Didot Professional can produce excellent printed results in their own right, so why do you need an additional printing program?

Firstly, you have to understand the difference between PostScript output and that of a dedicated printer driver employed by PageStream or Didot. For example, PageStream uses the outline font and graphic elements placed on a given page to directly create a bitmap representation of the page in memory at the resolution of the printer being used, in a process often referred to as rasterising. When as much of the page has been compiled as is permitted by the available memory, the bitmap image of the page is then sent down the centronics cable (or DMA for SLM users) to the printer.

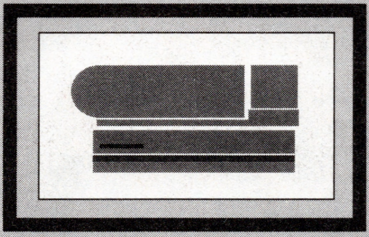
PostScript, on the other hand, works in an entirely different way. As I explained in part one, a PostScript printer is a dedicated computer with a printing engine bolted on. Instead of the rasterization being carried out by the host computer, all PostScript code is sent to the printer in the form of instructions and raw data, which the printer then interprets and prints. One of the many reasons for this seemingly convoluted system is to provide compatibility with evolving technology, removing the threat of expensive font libraries becoming obsolete, no matter how far typeface technology advances. The down-side of this is increased processing time, since many affordable PostScript printers can only rasterize at the speed of their built-in processors, which is invariably slower than that of the host computer to keep the cost down.

Right, back to the point. Since the way PostScript drivers and PageStream or Didot Printer drivers interpret a page can often differ very subtly, what you get back from a bureau will often be WYSINWYE, or What You See Is Not What You Expected , resulting in a time consuming and costly reworking of page elements in your DTP package back at home or the office, followed by another trip to the bureau for a second try. All because the respective interpreters cannot agree on exactly how a page should be printed!

CompoScript, in essence, is a derivative of the PostScript Interpreter actually built into PostScript Level 1 printers and imagsetters. Although not fail-safe, it allows you to produce a proof copy of your document using the actual PostScript file you are going to give to your bureau. This obviously allows you to spot inconsistencies and correct them on your own system before taking them for imagesetting, safe in the knowledge that at least one dedicated PostScript Interpreter has done what you wanted it to.

As with all things PostScript, however, things don't always run as smoothly as they should. PageStream version 2.2's improved PostScript driver fails miserably with CompoScript, even with the new v1.04 release which Compo claim is compatible with the new PageStream drivers, except PageStream's bugs . It's not clear which package is to blame for these inconsistencies, but predictably Soft-Logik and Compo are blaming each other. A simple solution to the problem is to revert back to the first PageStream PostScript driver, as was originally supplied with v2.1 of PageStream. It lacks some of the new driver's advanced features such as slur gauges and CMYK colour strips, but it produces much smaller PostScript files, and most importantly, it works!

LEVEL 1 or LEVEL 2?



PostScript Level 1 or Level 2? What's the difference? Which is available for the Atari? Put simply, Level 2 is an upgrade to the original PostScript standard, which was originally developed way back in 1985. The upgrade is not actually as huge as the jump in version numbers suggests, and unless you are working in high resolution colour, there is not a great deal to be gained by switching to the new standard. Tweaks to the memory management and data handling algorithms have improved speed and file sizes, and CMYK, RGB and CIE colour extensions have been added. In fact, very few affordable PostScript printers incorporate PS level 2. Predictably, the Apple LaserWriter IIg is one of the few, and more recently, the stunning new HP LaserJet 4M has joined the handful of printing engines to offer the new standard. Not that this will be of any consequence to Atari owners anyway: all current PostScript friendly Atari applications support Level 1 only, although this code should print on Level 2 printers without problems. Now where have you heard that before?

Any Other Benefits?

Hand in hand with the professional support for PostScript, the Apple and IBM Public Domain and Shareware scene is absolutely crammed with clip art, vector art and Adobe Type 1 fonts, some of which are of such high quality, you wonder what they are doing in the Public Domain in the first place. Check out the ST Club's Adobe font disks (FON.114-117) - the quality will amaze you.

Going All The Way!

Adopting the route described gives you the best of both worlds. Printed output using any of the three mentioned packages is exceptional on any printer. But if and when the time comes that you need output of the highest quality, and you are not related to J.P.Getty or Bruno Brookes, then you will need to employ the services of a bureau. Fortunately, you have a system which allows you to handle as much of the page layout process as possible, and greatly reduces the cost involved in producing high quality material when compared to allowing a bureau and print shop to handle the whole job. In fact, by being your own design consultant and typographer you have already saved yourself the bulk of a design and print quotation. Next time you have absolutely nothing better to do, go into a Mac based design bureau and ask them for a quote to compile a high-gloss A4 flyer or poster from scratch. Make sure you are sitting down before they hit you with the quote, try not to look surprised, then walk out with a smile on your face.

Nevertheless, the imagesetting and printing processes can be equally treacherous, and can end up costing an arm and a leg. If you follow some of the following simple rules (learned the hard way) then you could end up saving yourself a small fortune...

Decide whether you really need colour output right from the outset. High resolution single colour documents can have as much impact as a full colour production, which can cost up to four times more, regardless of resolution. And unless you are absolutely desperate to use gold and silver on a page, avoid them like the plague because the cost of reproducing these is absolutely phenomenal. Also, photographs are often a stumbling block at this stage. Colour photographs are best handled using traditional methods at the printer's since PostScript colour output can cost a fortune owing to the time required to process the image at a bureau, and the size of a high resolution colour file is cumbersome and impractical unless you are using removable Bernoulli hard disk cartridges or 3.5 floptical disks. Monochrome photos are more practical, and providing you have a scanning system which can produce half-tone grey scale images, you will cut out an additional process at the printer's and so save money.

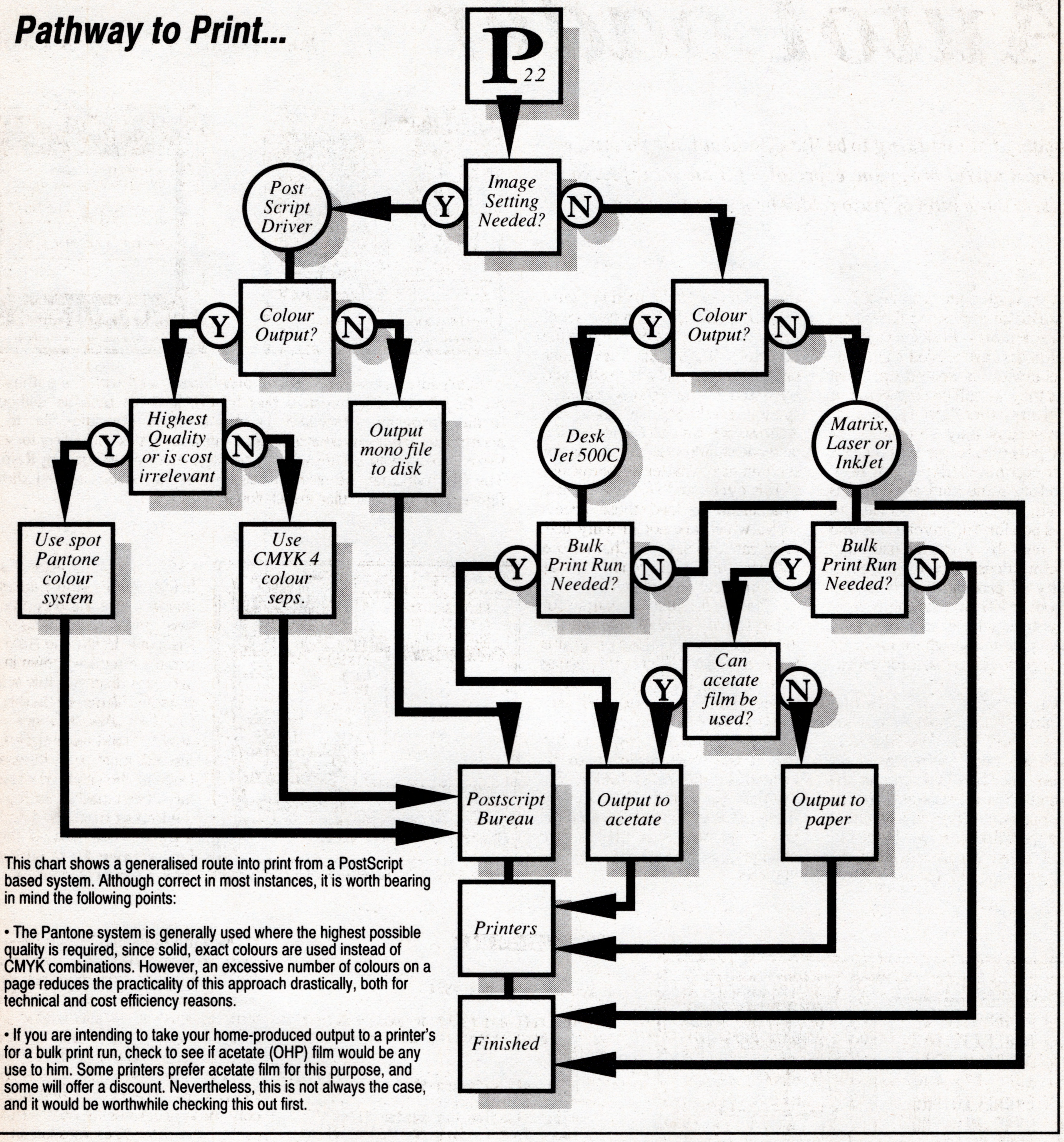
Before you even set foot in a bureau, go to a printer's and tell him your requirements. Get a few quotations, since prices can very wildly between firms - you may be paying for the use of a printing facility geared up to high-volume output, while smaller print shops could provide equal quality on a smaller scale. Also, find out whether it would be cost effective to supply the printer with a camera-ready bromide or film.

When you have a rough quote you are happy with, find out whether the printer requires:

positive or negative film
right reading or wrong reading
emulsion side up or down

Any imagesetting bureau will be able to produce film to the printer's requirements, usually at no extra cost, but PageStream allows you to produce PostScript files that will conform to the printer's requirements without having to get the bureau to do it for you

Pathway to Print...


P22
Image Setting Needed?
Y
N
Post Script Driver
Colour Output?
Y
N
Colour Output?
Y
N
Highest Quality or is cost irrelevant
Y
N
Output mono file to disk
Desk Jet 500C
Matrix, Laser or InkJet
Use spot Pantone colour system
Use CMYK 4 colour seps.
Bulk Print Run Needed?
Y
N
Bulk Print Run Needed?
Y
N
Can acetate film be used?
Y
N
Postscript Bureau
Output to acetate
Output to paper
Printers
Finished

This chart shows a generalised route into print from a PostScript based system. Although correct in most instances, it is worth bearing in mind the following points:

- The Pantone system is generally used where the highest possible quality is required, since solid, exact colours are used instead of CMYK combinations. However, an excessive number of colours on a page reduces the practicality of this approach drastically, both for technical and cost efficiency reasons.

- If you are intending to take your home-produced output to a printer's for a bulk print run, check to see if acetate (OHP) film would be any use to him. Some printers prefer acetate film for this purpose, and some will offer a discount. Nevertheless, this is not always the case, and it would be worthwhile checking this out first.

via the imagesetter's negative and mirror options. By giving the printer exactly what he wants you are reducing the number of processes needed to produce finished material, and reducing the overall bill proportionately.

Depending on your own requirements, once you have your PostScript file from PageStream or Didot and have proofed it with CompoScript or a PostScript laser printer, you are potentially only two steps away from a high resolution glossy document. By taking over as many processes as possible, the cost involved can be surprisingly low.

This article has just touched the surface of an undeniably complex subject. There is a lot more that could be said, but obviously that is best left to the dozens of books dedicated to the subject. Anyone considering setting up a DTP system would be well advised to consider the PostScript option carefully - considering the continuing worldwide support and on-going development of the PostScript system, it is as future-proof as anything in the volatile world of computing can be. I said earlier that PostScript support on the Atari was in its infancy, but that looks set to change. Atari's recent decision to use the PostScript system as the basis for it's long overdue GDOS replacement, FSM-GDOS, or Speedo, could be one of their shrewdest ever.

AutoLoader

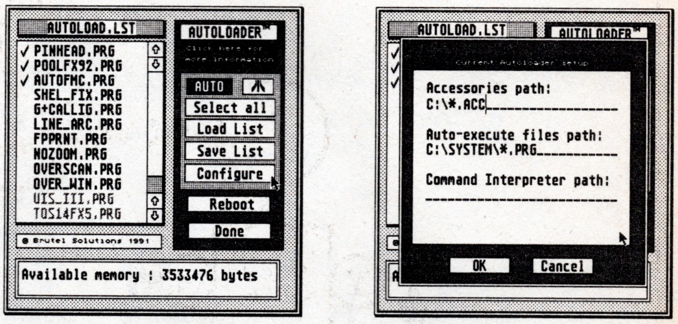
Reviewed by Derryck Croker

Probably the last thing to be thought about but certainly the most useful program, especially for owners of hard disks, is some kind of Auto folder boot-up manager.

Most computer users have a few favourite or necessary TSR (Terminate and Stay Resident) system patches that are loaded each time the computer is booted up. Most times they will all be required, but sometimes the Ram space that these occupy may be needed for other purposes or perhaps there is an incompatibility problem. Therefore some kind of control is needed, but one that is as easy to use as possible for anyone else who may only be a casual user and therefore does not want the complexity of programs such as Superboot or XBoot - and this is especially true where an alternative Desktop is in use, where program icons can be placed on it for execution.

AutoLoader is a simple, straightforward answer from the PD world (ST Club disk DMG.33). It satisfies both the needs of the person described, who can let the computer boot straight to the desktop, and the person who wants more specialised setups. These can be set either by interrupting the boot process and choosing from the menu (as can be seen in figure 4) or by picking from a new set of programs using the accompanying accessory (figure 2). Auto folder programs can easily be tested and bypassed if they should cause a system crash and reboot cycle. Accessories can also be set, but if a new one should crash then it is not such an easy matter to break out of this cycle, and so I always use Chameleon to load those accessories which are not in daily use. (You can load several Chameleons by recopying it and renaming it at the name conflict dialogue.)

There are just a couple of points to bear in mind before moving all your Auto folder programs to a System folder and letting AutoLoader take up sole residence. Some programs will only run from an Auto folder, and some have configuration programs that expect the main program to be located in the Auto folder, for example AutoSwitch OverScan. In these cases you will have to temporarily move it there for changes, a very minor inconvenience.


AUTOLOAD.LST
✓ PINHEAD.PRG
✓ POOLFX92.PRG
✓ AUTOFMC.PRG
SHEL_FIX.PRG
G+CALLIG.PRG
LINE_ARC.PRG
FPPRNT.PRG
NOZOOM.PRG
OVERSCAN.PRG
OVER_WIN.PRG
UIS_III.PRG
TOS14FX5.PRG
AUTOLOADER™
Click here for more information
AUTO
Select all
Load List
Save List
Configure
Reboot
Done
© Brutel Solutions 1991
Current Autoloader setup
OK
Cancel

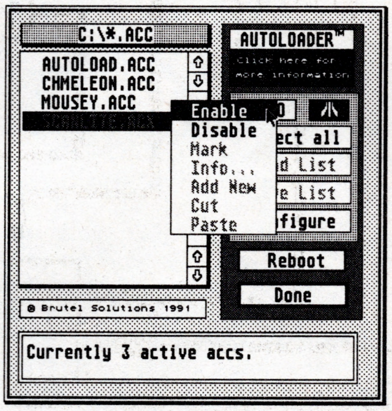
Available memory : 3533476 bytes

Accessories path:
C:\*.ACC

Auto-execute files path:
C:\SYSTEM\*.PRG

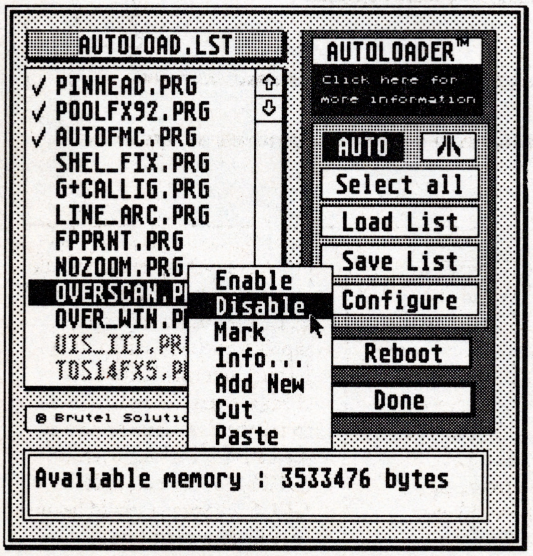
Command Interpreter path:

△ Autoloader's accessory control panel configured with the pathname of the folder containing system files (right). It is not possible without the further program described in AutoLoader's Readme file to load accessories from anywhere except the boot disk's root directory. The system folder can be anywhere, perhaps even a self-loading Ram disk. The CLI path may be used to call it from the options screen shown in figure 4. In this particular installation it is not used.

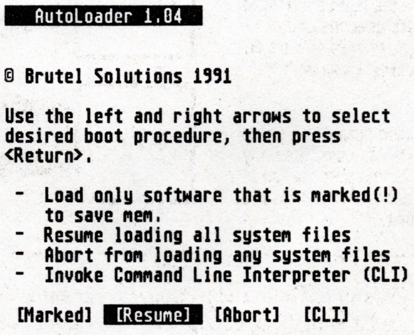

C:\*.ACC
AUTOLOAD.ACC
CHMELEON.ACC
MOUSEY.ACC
AUTOLOADER™
Click here for more information
Enable
Disable
Mark
Info...
Add New
Cut
Paste
Select all
Load List
Save List
Configure
Reboot
Done
© Brutel Solutions 1991

Currently 3 active accs.

◁ Clicking on the Atari Fuji brings up this simple accessory handler, offering only the top two options of Enabling or Disabling. Unlike the Auto program section shown in the previous diagram, this actually renames filenames (in this case to .ACX) when they are disabled (and back again), so the disk must be write-enabled. Once all the required changes have been made, clicking on the Reboot button will perform a warm reset, with an alert box allowing the saving of the list if it has been changed.


AUTOLOAD.LST
✓ PINHEAD.PRG
✓ POOLFX92.PRG
✓ AUTOFMC.PRG
SHEL_FIX.PRG
G+CALLIG.PRG
LINE_ARC.PRG
FPPRNT.PRG
NOZOOM.PRG
OVERSCAN.PR
OVER_WIN.PR
UIS_III.PR
TOS14FX5.PR
AUTOLOADER™
Click here for more information
AUTO
Select all
Load List
Save List
Configure
Reboot
Done
Enable
Disable
Mark
Info...
Add New
Cut
Paste
© Brutel Soluti

Available memory : 3533476 bytes



```
AutoLoader 1.04

© Brutel Solutions 1991

Use the left and right arrows to select
desired boot procedure, then press
<Return>.

  -   Load only software that is marked(!)
      to save mem.
  -   Resume loading all system files
  -   Abort from loading any system files
  -   Invoke Command Line Interpreter (CLI)

[Marked] [Resume] [Abort]  [CLI]
```

Figure 4

◁ Once the AutoLoad.Lst has been configured and the system rebooted, AutoLoader runs through it, announcing on-screen what program it is loading in turn. However if it is interrupted with a press of the right-hand Shift key (which may be done at any time during this process), then the simple options screen shown here appears. The first will load only those programs that were marked earlier, the second resumes loading as if nothing had happened, and the third skips any further entries in the list. Once any further programs in the Auto folder have been executed then the Desktop appears as normal.

◁ AutoLoader's boot program uses a text file called Autoload.Lst to tell it both which programs to load and in what order. The accessory makes for easy editing of this list as well as a way of rebooting the system once the required changes have been carried out. Other lists of programs may also be made and saved and loaded using the appropriate buttons.

The editing menu is called up by selecting one of the entries with the left mouse button, and then a click on the right brings up the sub-menu. Simple cut-and-paste takes care of the reordering of program execution, cut alone removing it completely from the list. Add New brings up the file selector to choose a further program to be added to the list - it is added above the highlighted item. Info does nothing except show the full pathname of the highlighted item. The top three choose what happens when AutoLoader is interrupted during the loading process. Marked items (those shown with a tick mark) are always loaded (but see figure 4). Disabled programs are shown greyed-out and are never loaded, and Enabled programs regain their solid black type and take on the load status that again will be shown in figure 4.

XBoot III

Since Joe Connor compared XBoot 2 to Superboot back in STA 9 it's become an integral part of his set up. But why an upgrade? There's nothing wrong with version 2. Curiosity eventually got the better of him.

XBoot and other Boot managers perform a simple but crucial role in providing control over which Auto folder files and Desktop Accessories will be active during the following session. Additionally, XBoot provides control over CPXs (Control Panel eXtensions) and through the concept of Sets provides powerful and flexible control over your working environment.

Who benefits?

Most of us amass collections of seemingly vital utilities and I would hazard a guess that most of them are used infrequently at best. Running all these extras every session will soon cause problems. At best expect to run out of memory or accessory slots, more likely the whole system will become unreliable as utilities clash with one another. A Boot manager helps avoid these tangles.

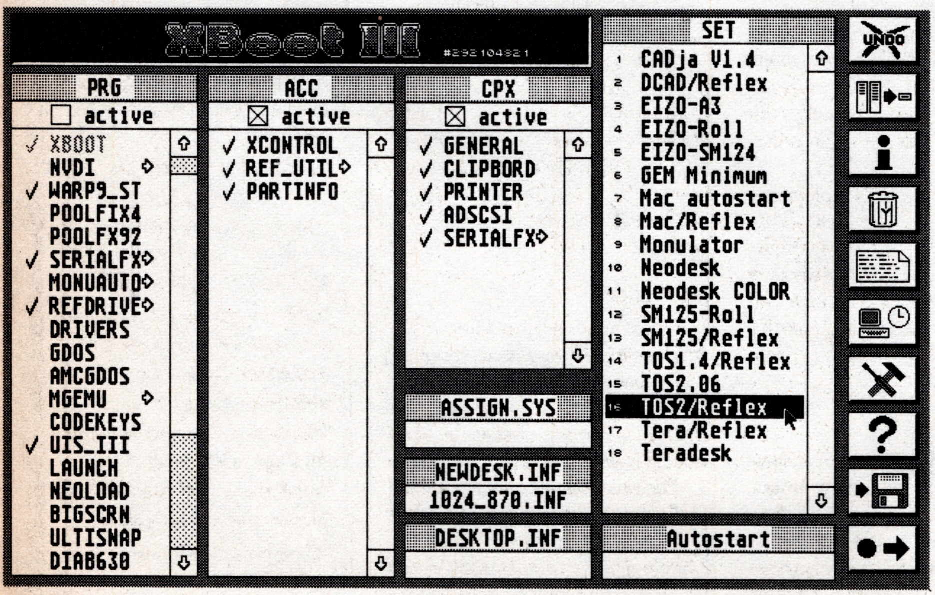
There are other solutions. Trojan Horse-style accessories such as The Chameleon and DC Stuffer can load accessories 'on the fly' but do nothing to alleviate Auto folder or CPX overload. Files can be manually deactivated by renaming their file extender; for example, by renaming XCONTROL.ACC to XCONTROL.ACX it becomes disabled and will not be installed as an accessory. XBoot uses this method to automate the process.

XBoot III, like earlier versions, provides an Installation utility to install XBOOT.PRG as the first file in the Auto folder. It needs to do this in order to gain control over all the other Auto programs. As I clicked on INSTALL.APP it occurred to me the new version might destroy my existing configuration, but before I had time to panic it was all over and 'installation was successful' appeared on screen. Tentatively rebooting the system, there it was, Hotwire! Oops, my mistake, XBoot III with sporty new icon-laden interface. It's worth pointing out that the mouse-driven user interface had to be completely custom written as the GEM AES functions which normally provide the mouse functions is unavailable to Auto folder programs.

Features

Although numerous new features have been added to XBoot it was pleasing to find all the original features functioning as before.

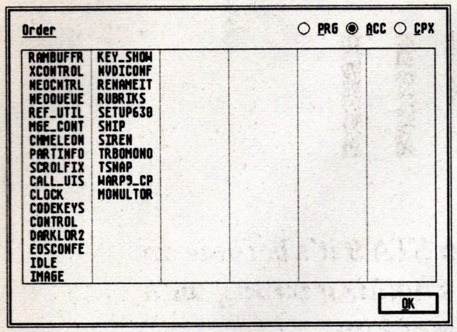
- CPX (Control Panel extension) handling: when Atari introduced the new Control panel accessory with its CPX modules my dark side immediately suspected a plot. XBoot, like many other utilities, renames the last character of the file extension to X to disable it, but this won't work with .CPX will it? XBoot circumvents this obstacle by renaming CPXs to CPZ.
- Password protection: although unlikely to prove much of a barrier this feature is described as 'another obstacle in the path of unauthorised use of your machine' and as such it is.
- Links: often Auto folder programs are provided with a supporting Accessory or CPX module. XBoot can link these together so that they are automatically activated or deactivated together.
- Running order: file sorting is much improved and is now handled from a separate sorting screen. Files can be reordered by dragging files to the desired position in the running order.
- Show active files only: this option is especially useful now that the Auto folder and ACC windows are reduced to single columns to make room for CPXs.
- Global add/delete file from set facility.
- XBoot configuration now takes place from within the main application, not from a separate configuration program.


XBoot III
#292104821
PRG
☐ active
✓ XBOOT
NVDI ⇨
✓ WARP9_ST
POOLFIX4
POOLFX92
✓ SERIALFX⇨
MONUAUTO⇨
✓ REFDRIVE⇨
DRIVERS
GDOS
AMCGDOS
MGEMU ⇨
CODEKEYS
✓ VIS_III
LAUNCH
NEOLOAD
BIGSCRN
ULTISNAP
DIAB630
ACC
☒ active
✓ XCONTROL
✓ REF_UTIL⇨
✓ PARTINFO
CPX
☒ active
✓ GENERAL
✓ CLIPBORD
✓ PRINTER
✓ ADSCSI
✓ SERIALFX⇨
ASSIGN.SYS
NEWDESK.INF
1024_870.INF
DESKTOP.INF
SET
1 CADja V1.4
2 DCAD/Reflex
3 EIZO-A3
4 EIZO-Roll
5 EIZO-SM124
6 GEM Minimum
7 Mac autostart
8 Mac/Reflex
9 Monulator
10 Neodesk
11 Neodesk COLOR
12 SM125-Roll
13 SM125/Reflex
14 TOS1.4/Reflex
15 TOS2.06
16 TOS2/Reflex
17 Tera/Reflex
18 Teradesk
Autostart
UNDO

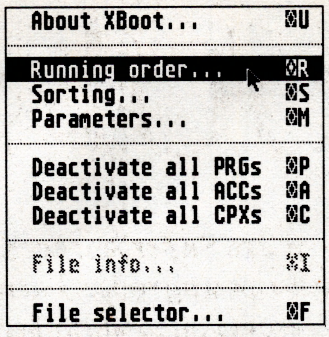
Active files are denoted by a tick, read-only files are greyed out. Linked files display a right arrow symbol, and its associated file (or Info on any menu entry) can be displayed by double clicking on it. Clicking in any of the four small boxes brings up the file selector enabling the desired file to be selected. Most of the time I leave the active box, at the head of each column, checked, giving an overview of the active set.

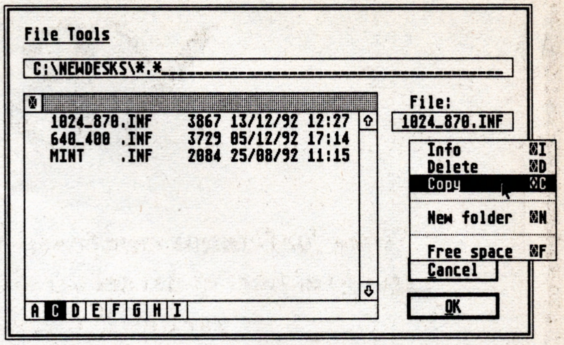
The icons represent, top to bottom:

- ☐ Undo all changes since running XBoot.
- ☐ New set: brings up set creation dialog.
- ☐ Set Info: brings up same dialog, which is editable.
- ☐ Delete set.
- ☐ Batch commands: if the active set contains batch commands this icon is ticked.
- ☐ System Info: enables time & date to be edited, displays TOS version and country.
- ☐ Utilities: displays pop-up menu with range of options.
- ☐ Help: displays a simple help dialog.
- ☐ Save sets: saves all set Info; old set definitions are saved with a BAK extension.
- ☐ Quit XBoot: if sets have been changed a dialog box appears offering a chance to Save the set definitions before exiting XBoot



```
RAMBUFFR  KEY_SHOW
XCONTROL  NVDICONF
NEOCNTRL  RENAMEIT
NEOQUEUE  RUBRIKS
REF_UTIL  SETUP630
MGE_CONT  SHIP
CHMELEON  SIREN
PARTINFO  TRBOMONO
SCROLFIX  TSNAP
CALL_UIS  WARP9_CP
CLOCK     MONULTOR
CODEKEYS
CONTROL
DARKLOR2
EOSCONFE
IDLE
IMAGE
```

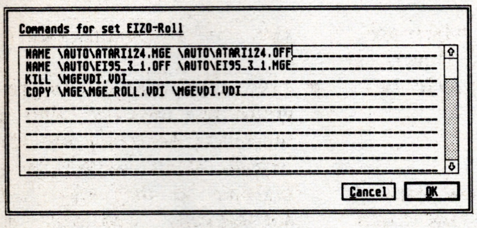




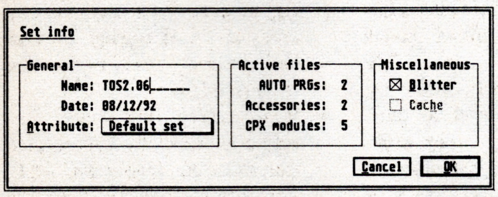
```
C:\NEWDESKS\*.*

1024_870.INF    3867 13/12/92 12:27
640_400 .INF    3729 05/12/92 17:14
MINT    .INF    2084 25/08/92 11:15

File: 1024_870.INF
```



```
NAME \AUTO\ATARI124.MGE \AUTO\ATARI124.OFF
NAME \AUTO\EI95_3_1.OFF \AUTO\EI95_3_1.MGE
KILL \MGEVDI.VDI
COPY \MGE\MGE_ROLL.VDI \MGEVDI.VDI
```



Name: TOS2.06
Date: 08/12/92
Attribute: Default set
AUTO PRGs: 2
Accessories: 2
CPX modules: 5
☒ Blitter
☐ Cache

Bottom left: appears during editing or creating a new Set. A pop-up menu next to attribute enables one Set to be made the default Set. This can be either the 'last active Set', a 'fixed set' or a 'fixed set each for colour and mono', or 'no set' in which case XBoot waits for input.

Centre left: this example enables a large screen monitor mode to be set up at boot time. Batch commands can also double up as extra Info file slots if the three available slots are already defined.

Top left: the Sort screen works just as you would expect: a simple click and drag operation, a big improvement over the previous version.

Top centre: the Utility pop-up menu. The Sorting option allows each column display to show the order they were created in or in alphabetical order. The Parameters option displays the default options, which were set using a separate utility in earlier versions.

Top right: the file selector, which is adequate, can be invoked from the Utility menu for peeking around but also includes some useful options. The Info option allows the fastload bit, read/write status and TT memory handling to be set.

- The File Selector includes options to Show Info, Delete and Copy files, create a new folder and show free disk space. Handy for Boot time fine-tuning.
- A set can be assigned to run after the preset time out option is reached and can be either the last set run, a fixed set, a fixed Mono/Colour set or no set. Much better than V2 which ran the last set executed and had me running for the keyboard on more than one occasion.

Old favourites

For those without hard disks or battery back-up clocks, time and date entry can be forced. Each Set can autoboot a GEM program, pre TOS 1.04 owners cannot autoboot programs without extra help and they will find an extra utility program automatically copied into their Auto folder to make use of this feature. Keyboard Shortcuts are available for all options. The old Status line along the bottom of the screen has been replaced by a centre screen box which appears after XBoot is exited displaying the file actions taking place.

- Info file handling: you are probably already aware of the problem, as each GDOS application and desktop resolution needs a different Info file. XBoot handles these complications neatly, the chosen Info filenames (eg. NEWDESK.INF, DESKTOP.INF and ASSIGN.SYS) are entered into the configuration screen which appear as titles over the small boxes on the main XBoot screen. 'Alias' files are assigned by clicking in the relevant Info box and loading the desired file using the file selector.
- Batch Commands: enable commands to be executed automatically for each set. Files can be copied, conditionally copied, renamed, deleted or run. Extra Info files can be accessed using the Copy command.

Boot time

Fortunately, my existing configuration survived relatively intact. My ASSIGN.SYS and DESKTOP.INF files were swapped around but this was easily corrected using the Parameters option from the Utility menu. I was soon in familiar territory with all my old set definitions to choose from. I tend to define two different types of sets:

- General sets, designed to arrive at a particular desktop or TOS version.
- Productivity sets, fine-tuned for a particular application on those dull occasions when I have to work for a living.

XBoot allows an extra 2 characters for each set name but it still strains my ingenuity to think up shorthand names for Sets, e.g. DCAD/Reflex is a custom DynaCADD set, running on the Reflex graphic card using TOS 2 (or TOS 1.4) with a Diablo 630 emulator, UIS III and Warp 9 active.

Summary

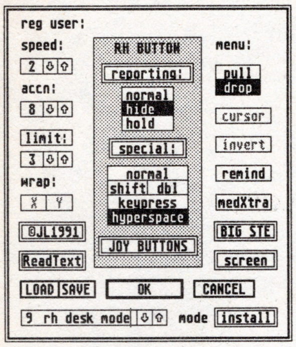
Complex system setups derive the most benefit from XBoot. Running more than one monitor/resolution, TOS version or diverse range of utility software makes a Boot manager indispensable.

The new XBoot features are not fluff, they're really useful. File linking removes at a stroke my infinite capacity to mismatch useful pairs. The new Sort screen knocks another stand-alone utility off the hard disk. Nearly all the (useful) features once exclusive to its Shareware rival, Superboot, have been implemented in XBoot. I would not like to be without it.

Alternatives: Superboot, up to version 8; shareware, a well-supported keyboard-driven cheaper alternative.

Product:...... XBoot
Version:.........3.00
Distributor:....HiSoft, The Old School, Greenfield, Bedford, MK45 5DE.
Telephone:....+44 (0)525 718181
Fax:...............+44 (0)525 713716
Price:.............£34.95 inc VAT. Upgrades are available from previous versions for £19.95 inc VAT. Contact HiSoft for details.
Manifest:........Single disk and 56 Page A5 Manual
System:..........All Atari 680x0 in monochrome or colour. Minimum resolution is 640x200

Mouse Tricks 2


reg user:
speed:
2
accn:
8
limit:
3
wrap:
X
Y
©JL1991
ReadText
LOAD
SAVE
RH BUTTON
reporting:
normal
hide
hold
special:
normal
shift dbl
keypress
hyperspace
JOY BUTTONS
OK
CANCEL
9 rh desk mode
mode
menu:
pull
drop
cursor
invert
remind
medXtra
BIG STE
screen
install

- Mouse Tricks combines many of the functions of existing mouse utilities in a single desk accessory and adds numerous extra functions of its own.
- Mouse Tricks can set up suitable modes of mouse behaviour for particular programs. An optional screen saver is also included.
- Mouse speed can be reduced as well as increased. This allows a cross-hair mouse add-on such as "Tracey" to trace artwork of any size.
- All the functions of Mouse Tricks can be adjusted through a set of easy to follow dialog boxes.
- As many as 20 different settings can be named and saved, and each mode can be selected via a dialog or a user selected keycode.
- Mouse Tricks keeps a list of up to 40 different programs; for each program on the list you can specify both the mode you wish to be installed when a program is run, and the maximum amount of memory initially available to that program.
- Mouse Tricks contains a text reading utility, Read Text, with which you can load, read and switch between as many as eight text files from within any program that allows access to desk accessories.
- Read Text can also be invoked by double-clicking on the desktop icon of the file you want to read, or by pressing a user defined keycode.
- Big STE is a virtual screen utility that uses the STE's video display hardware to provide instantaneous smooth scrolling around virtual large screens of any (feasible) dimensions, with the option of an interlaced display for any screens with double (or greater) the normal screen height.
- Tutorial function to help you learn to use Mouse Tricks.

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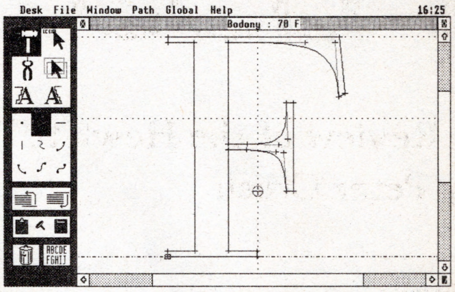
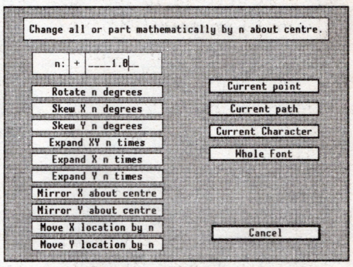
Fonty

Calamus Font Editor

This is a fully featured editing program for creating and editing Calamus CFN-format font files. Also, when used in conjunction with C-Font or Fontkit Plus, CFN files created with Fonty can be used to generate sets of bit-mapped fonts for use in packages such as: K-Spread4, Degas Elite, Timeworks DTP, Calligrapher, That's Write, Redacteur 3, and Wordflair.


Desk
File
Window
Path
Global
Help
16:25
Bodony : 70 F
ABCDE
FGHIJ

Fonty features include: draw mode icons (Hammer mode, Pliers mode, Move mode, Select path mode, left and right kern mode), Grids and Guide Lines, Manual and Automatic kerning, Backgrounds for tracing (a Degas picture or a complete GEM font), a full feature Calculator to mathamatically manipulate fonts, and Window scaling. A separate program, PFB2CFN, reads a Postscript Type 1 Font file and copies it into a Calamus CFN font file.


Change all or part mathematically by n about centre.

n: + 1.0

Rotate n degrees
Skew X n degrees
Skew Y n degrees
Expand XY n times
Expand X n times
Expand Y n times
Mirror X about centre
Mirror Y about centre
Move X location by n
Move Y location by n
Current point
Current path
Current Character
Whole Font
Cancel

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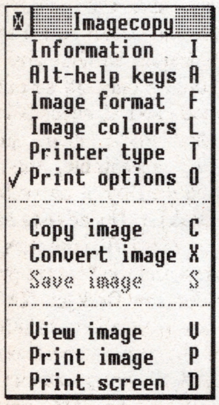
Imagecopy Colour


Imagecopy
Information I
Alt-help keys A
Image format F
Image colours L
Printer type T
✓ Print options O
Copy image C
Convert image X
Save image S
View image V
Print image P
Print screen D

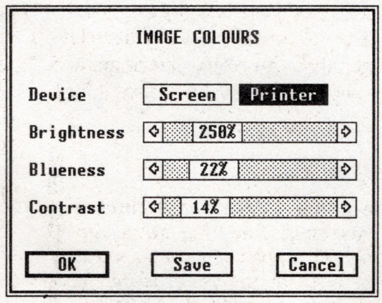


IMAGE COLOURS

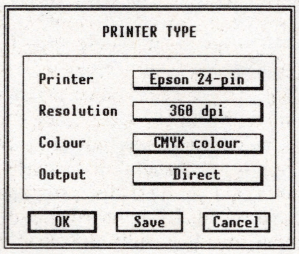
Device: Screen [✓ Printer]

Brightness: 250%

Blueness: 22%

Contrast: 14%

OK
Save
Cancel


PRINTER TYPE

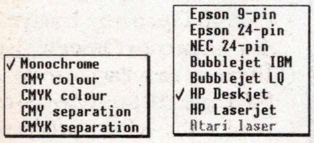
Printer: Epson 24-pin

Resolution: 360 dpi

Colour: CMYK colour

Output: Direct

OK
Save
Cancel


✓ Monochrome
CMY colour
CMYK colour
CMY separation
CMYK separation
Epson 9-pin
Epson 24-pin
NEC 24-pin
Bubblejet IBM
Bubblejet LQ
✓ HP Deskjet
HP Laserjet
Atari laser

The latest version of Imagecopy allows you to print colour images on a dot-matrix or inkjet printer. Colour images can be printed in any of the standard printer resolutions, and colour quality can be adjusted to increase the brightness, blueness and contrast of an image. If you don't have a colour printer, Imagecopy can print colour separations which may be superimposed to produce a full-colour image. In addition, the colour facilities can be used to improve the print quality of colour images which are printed in black and white.

Resolution options have been extended to offer an extra resolution for 9-pin printers (72 dpi), and another extra resolution for 24-pin and LQ bubblejet printers (60 dpi). The Laserjet slot contains two extra resolutions (200 and 600 dpi). These should work with the new HP Laserjet 4 printer.

The Colour menu offers five choices: Monochrome, CMY colour, CMYK colour, CMY separation, and CMYK separation. The colour separation modes can be used to print full colour images from a monochrome printer.

Because images normally print darker than they are displayed on screen, you can use the Imagecopy brightness setting to compensate for this. If your printer information specifies a 'gamma correction value' you can convert this to a brightness setting. The brightness setting can also be used to improve the way that colour images are printed or displayed on a monochrome printer or monitor.

A Blueness setting is available to compensate for the fact that colour printers sometimes print blue with a purple tinge. The Contrast setting increases the contrast between light and dark colours.

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Pass the HP

A Review of the Hewlett Packard DeskJet 550C Colour Printer, by Peter Crush

Just when you thought it was prudent to buy an inkjet or laser, HP have, with typical sauce, recently launched two new printers, giving you even more choice than ever, as Peter Crush discovers.

Hewlett Packard seem to have made a habit of releasing new versions of their printers every year, but they often appear suddenly and without much warning. Their DeskJet and LaserJet series of printers have become deservedly popular and are virtually the defacto standard for inkjet and laser printing. In fact, you might have been forgiven for thinking that these models had been developed to about as far as they could go. But just to keep everybody on their toes, HP have sprung two surprises, a new colour DeskJet (hot on the heels of the DeskJet 500C) and a brand new Laserjet too! Before either had arrived in the shops I was able to test both of them, starting with the new DeskJet.

Sing a Rainbow

So there it suddenly was, the DeskJet 550C, Hewlett Packard's recently introduced DeskJet printer that produces output in any colour you like, including Black. So how did this model come about? There now follows a potted history of the development of the DeskJet! HP claim to have sold over a million of their DeskJet printers since they were launched in 1988, and so many owners just can't be wrong. The original DeskJet was the first successful mass market inkjet printer, and although other manufacturers have brought out their own versions of inkjet machines, for many ST owners HP is the first and only choice, offering reliability and compatibility with most of their favourite software. After the original DeskJet came the DeskJet Plus, and then the DeskJet 500. All these were 300dpi machines, and gave equally good results. But these DeskJets were only mono printers until recently, and capable of using only the standard HP black-ink cartridges unless one experimented with the unofficial re-filled single-colour cartridges available from non-HP suppliers. To enable "proper" colour printing, not long ago HP produced the DeskJet 500C, a DeskJet that printed in colour without any cartridge changing and messy overprinting being necessary! This new colour version of the hitherto mono DeskJet understandably raised much interest, and achieves its colourful results by using a special three-colour cartridge, which can be taken out of the printer and swapped for a normal black one if you only want text. This colour DeskJet 500C seemed like a dream come true, but just when you thought the time to buy one had finally come, HP have rather unexpectedly launched yet another (and better) one!

The new DeskJet is known as the 550C, and on the outside looks pretty similar to all the previous models, i.e. that beloved stone doorstep shaped slab. If anything, it's a little nicer looking than older versions, and the sheetfeed trays have been improved in design and operation, now accommodating envelopes too. Otherwise you're on familiar ground, and the DeskJet 550C has the same general colour, size, finish and shape as all previous DeskJets. All the connections you need to make to the printer, i.e. parallel or serial printer lead and power supply, are made neatly out of sight underneath the machine at its rear, enabling it to be positioned flat against a wall if necessary. Opening up the bonnet reveals the important difference though: whereas the standard mono DeskJet has a slot-in ink-cartridge cum print-head containing black ink, and the 500C has a three-colour head, the new DeskJet 550C has two print-heads, both a normal black-ink cartridge **and** a three-colour one right next to it. The colour cartridge is a little larger than the black cartridge, and contains three inks, Cyan (blue), Magenta (red) and Yellow. When the 550C springs into life, the two print-heads sweep across the page simultaneously, printing in four colours at once to produce glorious full colour output. When you first set up the 550C an inbuilt alignment test procedure enables you to ensure that the colour cartridge printing lines up with the black printing. This is accomplished by the 550C printing a "test card" type pattern, and you chose the best alignment from the examples output by pressing the various buttons on the control panel as indicated in the printout itself. This locks in the correct settings to the printer, all very canny and easy to do. You only have to carry out this routine once, or when you install a new cartridge.

Paint it black

The new machine functions as a standard mono DeskJet 500 printer if you only want to print ordinary black text. Using Protext to output a sixty-line Test Page of text, it printed without any problems, taking only 38 seconds in draft mode and 45 seconds in letter-quality mode. Print quality was very acceptable, matching that produced by a an ordinary mono DeskJet. No adjustment of the printer's DIP switches was necessary, and the Protext printer driver for the DeskJet 500 was used. But how about printing in colour? At the moment only a handful of ST programs can take advantage of the 550C printer's four-colour capability, amongst them HPChrome by Martyn Dryden, Imagecopy Colour by Jeremy Hughes, and PageStream from SoftLogic. All these gave excellent results: the colours produced by the 550C are the best ever for a DeskJet printer. The only slight problem is the "bleeding" effect with the black ink, which tends to run slightly into the coloured inks. This is not always a problem, as it depends on what kind of image

What Use Is Colour?

"Serious" ST users may have been gazing at their monochrome monitors for so long that they have almost forgotten about the existence of colour. But even sober old ST Applications makes use of some colour - on the cover! As time goes by, the use of colour in publishing is becoming increasingly widespread, with all the glossy mags using it virtually on every page, and even the daily heavies such as The Times now using colour photos and layouts. But, until recently, colour wasn't really very practical for ST work. Firstly, not many programs had colour facilities, and secondly there was no practical method of printing in colour. Dot matrix colour printers have never really provided the quality and subtlety we all long for, and all the upmarket colour printers were completely out of reach in terms of price. The two factors that have changed this situation are the increasing amount of business and productivity programs for the ST that make use of colour, and the ability now provided by colour DeskJets or Bubblejets to output quality results in colour at affordable prices. With the better colour capabilities now provided by STEs and TTs, and the exciting new higher-resolution colour implemented on the Falcon, there will certainly be a strong move towards more and more colour for the home user. In a few years time we may look back with nostalgia on our monochrome days. Let's face it, unless "Casablanca" is on, who watches black and white TV nowadays?

you are printing and how much true black the picture contains. HPChrome deals with this by stopping the true black printing a dot or two short of the boundary with colour, and uses the dark brown "composite black" for much of the small black areas. It seems unlikely that HP can wring any further mechanical or resolution improvement from the DeskJet series, but then you never know! It seems to me that if there is any room for improvement with the 550C it's all down to the Hewlett Packard chemists. Now, can they formulate a quick-drying, non-running black ink to make the new machine 'Perfection Personified'?

It is to be hoped that software houses write DeskJet 550C drivers for their programs soon, and this is virtually guaranteed given the popularity of the DeskJet in general. The "street price" of the colour DeskJet 550C is already dropping to around £500 or less, as compared to under £350 or so for a standard mono DeskJet, so the extra money might very well be worth considering for the excellent capabilities of this new machine. No doubt many owners who shelled out over five hundred quid for a mono DeskJet 500 a couple of years ago, (or more tragically, purchased a 500C a couple of months ago!) are kicking themselves silly. Ah well, that's progress, and is it ever the right time to buy computer gear? Philosophising apart, the DJ 550C could mean increasingly multicoloured lives for the currently overwhelmingly grey "serious" ST user base.

Colourful Accessories

If you have the painting or drawing package Degas or Hyperpaint and want to print out your pictures on a colour DeskJet you will come across a problem: neither has a suitable printer driver! These programs were both written long before the advent of HP's new machines, and you will have to resort to using an external program such as HPChrome or Imagecopy Colour. This is not such a bad thing, as both of these utility programs can do some pretty damn clever things.

HPChrome comes from Martyn Dryden (the former head of the now deceased South West Software Library), who is no mean programmer. This cunning program enables the printing of any colour Degas or NEO pic on any DeskJet printer! On the older mono machines you have to swap cartridges between each colour, and put the same page through the printer a number of times. On the DJ 500C the three primary colours are printed at once. For the DJ 550C, Martyn has re-programmed HP Chrome to print all four colours in one go. To prevent the black ink from being a bleeding nuisance and running onto the colours, the software does some nifty calculations and prints black to stop just short of where the colours are on the paper. The resulting pictures are stunning, and if you want to try out Martyn's program, a demo version can be obtained from the ST Club or downloaded from ST Format's Bulletin Board Service. Get your modem to phone 0225 461330. Send Martyn £5 for the fully featured Shareware version and get the informative printed manual and Desk Accessory version too, which enables printing direct from within Degas.

Imagecopy Colour is the latest incarnation of Jeremy Hughes' excellent Imagecopy utility. This multi-talented DA can grab, load, save, convert, display and print out screen images. See the review in STA 24 for the full details. Although the earlier Imagecopy could display both colour and mono pictures on a mono monitor (coloured pics are dithered to give a greyscale indication of their true appearance), it could only print out images on mono printers. The latest version, Imagecopy Colour, can now print in colour, and very prettily too. It handles any model of DeskJet including the latest 550C, and like HPChrome it enables colour printing on mono DeskJets by allowing overprinting of the page with the cartridge swapping that this procedure entails. It can still output to all the other printers it used to, like Epsons, NECs, Bubblejets and Laserjets, and has a few nice added touches and improvements up its sleeve. Imagecopy Colour is available from The ST Club for £14.95; the upgrade from Imagecopy to Imagecopy Colour costs £4.95. Watch out for the full review soon in these pages.

Summary

Points For:

- ✓ It's a normal DeskJet when all you need is mono printing
- ✓ Has the ability to produce glorious colour prints without mess
- ✓ Very easy to use, excellent support available, reasonably priced

Points Against:

- ✘ Slight "bleeding" effect with the black ink into the colours, but it's not insurmountable.

Conclusion

Using the DJ 550C couldn't be easier, with nothing complicated to set up on the machine and good availability of mono printer drivers. (But do remember to switch ON the DeskJet 550C before the ST, or it won't print!) The four-colour printing method produces stronger, more vivid and more precise colours than any dot matrix colour printer can. When using the black cartridge only, it's as good as or better than the standard DeskJet 500. There isn't really any other affordable colour inkjet printer suitable for the ST market apart from HP's own 500C printer! Although you can get colour output from an ordinary DeskJet by re-filling the normal cartridges with coloured inks, it's all a bit messy, and involves putting the same page through the printer again for each colour. The previous 500C machine gives you proper 300 dpi colour printing for a bit more than the price of a mono DeskJet, but cannot deliver true four colour printing without a little fuss, involving overprinting with a black cartridge after the colour printing. The brand new 550C overcomes this with its twin print-heads, and gives you the best of both worlds, all in one unit. The price seems to be dropping all the time, and this printer could really be the best all-round machine for ST use to date.

Product:.........Hewlett Packard DeskJet 550C
Price:..............£810 (but available for around £500)
Supplier:........Hewlett Packard
Telephone:....0344 369369

Printing in Colour

Although there are various techniques of colour printing, probably the most common standard is known as CMYK. These initials stand for the three primary colours used: Cyan, Magenta, Yellow and the "K" is the k in blacK. Using just these four inks in various combinations, nearly any colour can be reproduced on the page. Whereas the HP DeskJet 500C has to synthesize black by printing Cyan, Magenta and Yellow on top of each other, giving a darkish brown/black hue, the new 550C can use the real thing to produce proper solid black. The major new advantage of having a black cartridge as well as the three-colour one is that "true black" can be obtained, and the additional black printing makes the other colours appear all the more vivid. The colour cartridges supplied by Hewlett Packard should offer consistent colour matching - the HP Paintjet printers (the expensive forerunners to the colour DeskJets) have long been used for colour proofing by users in the creative media generally.

DeskJet 550C Technical Details

SIZE: The printer is 443mm wide, 206mm high by 389mm in depth, and weighs in at 6.6kg (just over fourteen pounds). The power supply unit is an external transformer supplied complete with all leads and plugs.

FONTS: There are three built-in text fonts - Courier and Letter Gothic in a range of pitches, and CG Times in proportional spacing. All fonts are printable at either 6 or 12 points text height, and can be styled as expanded, underlined, subscript/superscript, bold and italic.

MEDIA: Paper or transparency film within the weight range 16 to 135 gsm in US Letter, US Legal and A4 sizes can be handled, and a new envelope holder is built into the lower sheetfeeder tray. The printer has a built-in sheet feeder holding up to 100 sheets.

GENERAL: The printer responds to HP PCL level 3+ commands, shared with other DeskJet models and the HP Laserjet II, and therefore works with software supporting these (using its black cartridge).

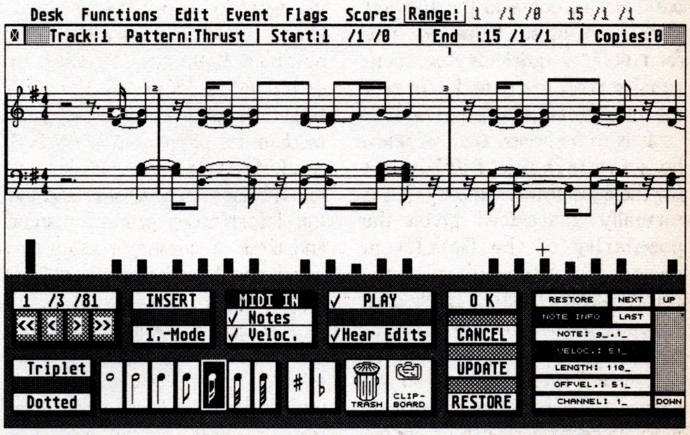
THE PRINTER BUFFER on the DJ550C is larger, at 80Kbyte as compared to 48Kbyte on the 500C and 16Kbyte on the standard DeskJet 500.

YOU CANNOT plug in the **Emulation Cartridges** that exist for the standard DeskJet 500s, thus turning them into Epson-compatible printers. This is not really a problem though, as virtually all decent ST software has a proper DeskJet printer driver anyway!

From Musical Keyboard... ...to Printed Page

by The Revd. Joe Clemson

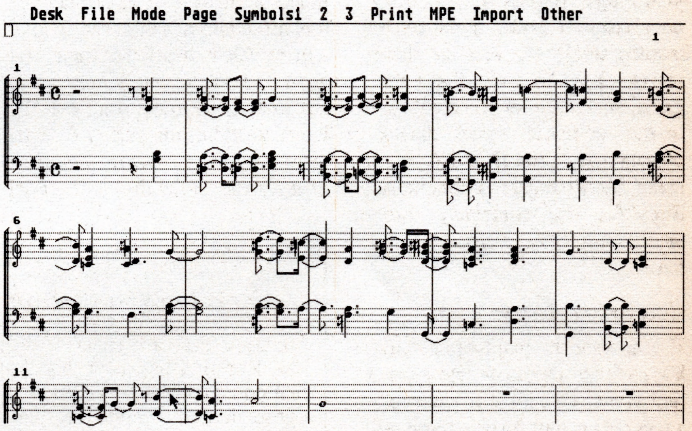
I have now taken part in two Church Computer exhibitions on behalf of the Atari ST Christian User Group. As a gesture to MIDI, that aspect of the ST where it holds a distinct advantage over other computers, including PC compatibles, I have taken along my Yamaha PSS580 keyboard and hooked it up. I say 'as a gesture' because I verge on the illiterate when it comes to things MIDI and musical. So God, showing, I suspect, his sense of humour, has then contrived to send along a steady stream of enquiriers - most of them anxious to know what the ST can do with MIDI. Oh well...



Track:1 Pattern:Thrust | Start:1 /1 /0 | End :15 /1 /1 | Copies:0

NOTE: g_.1_
VELOC.: 51_
LENGTH: 110_
OFFVEL.: 51_
CHANNEL: 1_

△ Figure 1
Pro 24's screen display of an unquantized MIDI file using its default settings.



△ Figure 2
Copyist's screen display of the same unquantized MIDI file using its default settings.

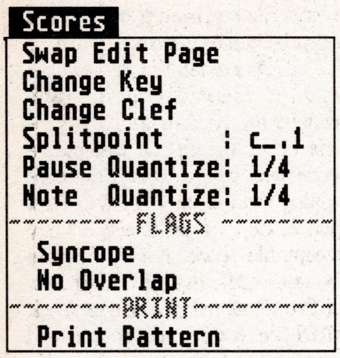
Many of those enquiring, and many in our user group, would like to be able to play a tune on the keyboard (their own composition or someone else's) and then obtain a printed score from their printer, without having to pay £300 or more for the privilege of owning software packages such as Cubase and Notator to do so. In addition, those who have explored the ground a little have discovered that such software, as well as being expensive, is also quite complex and contains features not needed by the average home or church musician. For such people a simple MIDI sequencer with a printed score facility limited to a treble and bass stave, selling at around £50, would be ideal. Sadly, it is not available. I believe the company who produced such a piece of software would clean up. Very few people will pay £100, let alone £300, for a tool they will use infrequently and not to its full potential. They will, however, be tempted by something under the £50 mark. The producers of 'Autoroute' failed to heed this lesson and wondered why few people bought - although many illegally copied - their excellent product which retailed at over £100. I recently had the opportunity to buy Autoroute secondhand at £25 and have counted it money well spent ever since. How many would the publisher have sold at this lower price from the beginning? Enough to recoup their development costs I would suggest. However, I digress. The £50 sequencer/scorewriter still remains a dream, so we must see what alternatives there are.

Two well established programs have come to into my hands recently. One is a secondhand purchase (Steinberg Pro 24) and one on loan for the purpose of review (Dr. T's Copyist Apprentice v.1.6). Both have the capability of producing the much desired printed musical score, and so I thought I would see how the two compared. The score printing facility of Pro 24 is, as we shall see, very much a secondary feature, although some comparative tables of MIDI/music programs appearing in the computer press do list Pro 24 as having a score print facility without indicating its limitations. Steinberg's offering, once retailing at over £200, is no longer available through normal retail outlets, having been superseded by Cubase. However, it has been available in recent months as part of an 'STE Music Master' package deal, being sold with an STE 1040 by Silica Shop and other ST dealers. Pro 24 may also be found as a secondhand item, usually for under £50. The Copyist Apprentice is still listed as available at a retail price of £95, although the copy I am reviewing here came bundled with Dr. T's Tiger Cub sequencer. I don't know if this bundling is still part of the current package or not.

Having just suggested that I am reviewing these packages, let me immediately retract. I am not making any attempt to review either Pro 24 or Copyist fully, although I will make reference to some of their features. What I am doing is recounting how I fared in one simple task - to take a MIDI music file of a hymn played with two hands on a keyboard and produce a score with treble and bass staves.

To have a MIDI file means beginning with a seqencer. With Pro 24 this is straighforward as the program is primarily a sequencer. With Copyist Apprentice it is necessary to use a separate sequencer to produce the MIDI file as Copyist is dedicated to producing the printed score. The choice of sequencer to partner Copyist is significant as it is necessary to be able to precisely edit the position and length of each note to be included in the finished score. Pro 24 is good in this respect with its graphical grid edit facility. Most sequencers will have the ability to edit to this degree, but some are easier to use than others. Choose your sequencer with care if you intend using it to prepare files for Copyist or any other score printing program.

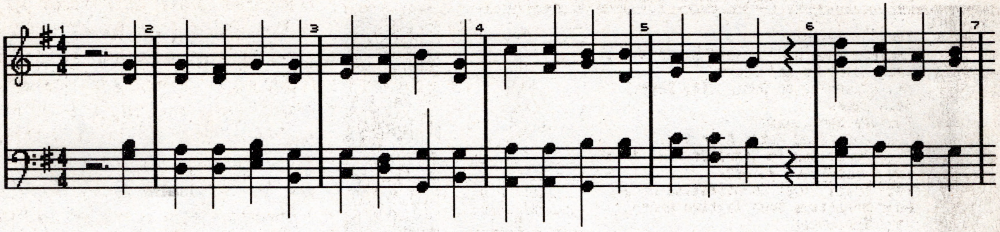
Why is this editing necessary? Well, what we see on the printed score bears only the most tenuous of links with what the organist



Splitpoint : c_.1
Pause Quantize: 1/4
Note Quantize: 1/4

△ Figure 3

Pro 24's score edit menu showing the variable options for transcribing a MIDI file to a traditional music score. Compare the options available for Copyist in figures 5 and 6.



△ Figure 4

The quantized MIDI file is transcribed and displayed by Pro 24, using its inbuilt options to select treble and bass clefs and a splitpoint of middle C. Copyist produced a comparable display when its settings were properly adjusted, except that it grouped three notes to each bar instead of four.

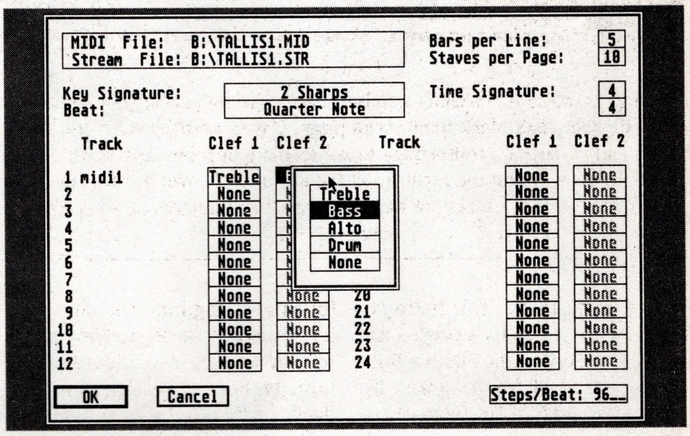
plays or the congregation sings. This is true of the best of musicians, not just those with no sense of rhythm or timing! The musician's performance is much more of an interpretation of what they see on the score than it is a direct translation. To reverse the process and transcribe the musical performance to the printed page means interpreting what has been played into a script meaningful to and readable by others. No mean feat. This is part of the reason why score writing programs are so expensive; they are really very complex.

If we take the ordinary playing of a church organist, preserve it for posterity in a MIDI file and transcribe it with the minimum of 'retouching' into a printed page, what we get is largely a confusion of notes, tie bars and short rests. Figures 1 and 2 show how Pro 24 and Copyist respectively coped with the same unquantized MIDI file (using the Tallis' Canon MIDI file from Sound Proof Ltd's Digital Hymn Book). In order to produce an acceptable score the MIDI file itself needs to be recorded playing the piece in very strict time. In its ultimate form such playing sounds terrible, mechanical and soul-less. No human can actually play precisely enough to record the MIDI file necessary to produce a good printed score without further treatment, more technically quantization, on translation to the printed score. It is here that the facilities of the sequencer come into their own. The human performance can be 'quantized' by the computer. Putting it simply, it is possible to get the computer to set all the notes to their intended length (assuming your original playing was a reasonable approximation to begin with) and to move them to their proper position in relation to the beats in the bar. I found this to be the most awkward part of the exercise, even with a very simple tune consisting entirely of crotchets (i.e. notes of one beat in length). I cannot play well enough myself to produce a suitable MIDI file and so I utilised the 'Tallis' Canon' file from The Digital Hymn Book. This piece was originally recorded with the intended purpose of leading a congreagation and so is very 'loose' in its timing and rhythm. So loose, in fact, that quantizing it was very difficult and much manual editing of the MIDI file had to be done, in particular removing spurious gaps in the music left when the notes had been quantized to their correct length and moved to the start of the nearest beat. In view of my experience, I would suggest that if you intend producing a printed score you should begin by recording a MIDI file specifically for that purpose. I should say now that both Pro 24 and Copyist include quantize features in their respective score producing sections, but it was my experience that getting the MIDI file right in the sequencer saved lots of wrestling with less powerful tools in the score edit section later on, this being especially the case with Pro 24.

Having produced the MIDI file we now had to translate it into a score on the screen prior to printing to hardcopy. At this point Pro 24 and Copyist diverge significantly, so I'll deal with them separately.

STEINBERG PRO 24

Pro 24 is primarily a sequencer and the score print aspect of the program is secondary. While, as its name suggests, you can have 24 tracks of music, you can only print the score of any one track at a time. This is a severe limitation which almost eliminates the possibility of multi-part scores, unless you use scissors and paste (real ones) to produce full scores from separate printouts of each track. The alternative would be to use a screen capture utility to capture images of single lines of music at a time, building them into a full score later via a graphics package. Painting the Forth bridge would probably be quicker and more rewarding.



MIDI File: B:\TALLIS1.MID
Stream File: B:\TALLIS1.STR
Bars per Line: 5
Staves per Page: 10
Key Signature: 2 Sharps
Beat: Quarter Note
Time Signature: 4/4

Track	Clef 1	Clef 2	Track	Clef 1	Clef 2
1 midi1	Treble			None	None
2	None			None	None
3	None			None	None
4	None			None	None
5	None			None	None
6	None			None	None
7	None			None	None
8	None	None	20	None	None
9	None	None	21	None	None
10	None	None	22	None	None
11	None	None	23	None	None
12	None	None	24	None	None

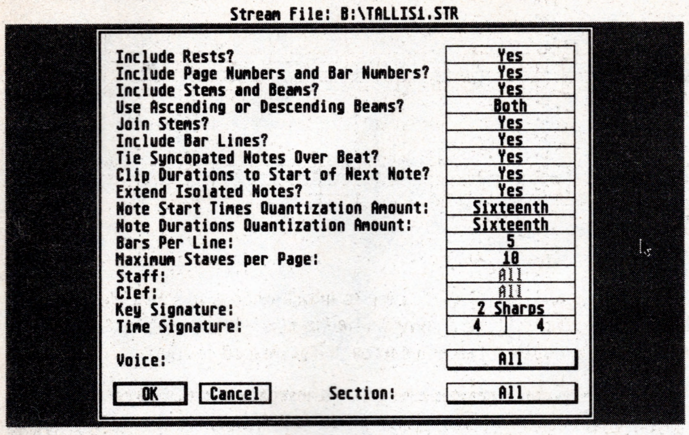
Steps/Beat: 96

△ Figure 5

Copyist Apprentice presents this screen of options when translating a MIDI file to its own 'stream file' format. Each track can be allocated up to two musical staves.

Pro 24 as a sequencer has a number of different ways of displaying and editing the MIDI data. One of these is the grid edit already mentioned, reasonably powerful and convenient even in today's advanced market. Another involves displaying the data in the form of a traditional musical stave. It is from here that a traditional music score can be edited and printed out. For each single track you can choose to show the music data on a treble clef, bass clef, or both together. If you chose both treble and bass you are given the option of where to set the splitpoint, i.e. to decide above and below which point on the scale the music will appear on the treble clef and which on the bass. This choice inevitably involves some compromise. If you examine a professionally set music score (and the way a pianist plays such music) you will see that some notes which are below the notional splitpoint on the musical scale actually appear on the treble clef because they are played by the right hand, and vice versa. Pro 24 (in common with other score programs which use this splitpoint method) is unable to make an intelligent decision about this and will sometimes place such notes on the 'wrong' staff, which can be very confusing to the keyboard player. Usually the way to avoid this is to record left and right hand on separate tracks of the sequencer. This doesn't work with Pro 24 as we cannot include two different tracks on the same score printout without resorting to scissors and glue or screen capture utilities as just mentioned. By contrast having left and right hand tracks separated would suit Copyist Apprentice perfectly.

There is another difficulty with Pro 24. If you use the sequencer in the way it is intended your masterpiece will be split into a number of 'patterns', each pattern being an identifiable and possibly repeated section of your composition. In a hymn, by its nature often repetitive in phrasing, each line might be a pattern. Unfortunately the score printing facility of Pro 24 can only print out one pattern at a time



Stream File: B:\TALLIS1.STR

Include Rests?	Yes
Include Page Numbers and Bar Numbers?	Yes
Include Stems and Beams?	Yes
Use Ascending or Descending Beams?	Both
Join Stems?	Yes
Include Bar Lines?	Yes
Tie Syncopated Notes Over Beat?	Yes
Clip Durations to Start of Next Note?	Yes
Extend Isolated Notes?	Yes
Note Start Times Quantization Amount:	Sixteenth
Note Durations Quantization Amount:	Sixteenth
Bars Per Line:	5
Maximum Staves per Page:	10
Staff:	All
Clef:	All
Key Signature:	2 Sharps
Time Signature:	4 4
Voice:	All
Section:	All

△ Figure 6

A large number of variables can be adjusted when reading the stream file onto Copyist's blank manuscript page. The same stream file can be read and re-read on to the page to acheive the best possible transcription before saving the manuscript file in Copyist's own ME format. Further extensive editing of the score can then be undertaken on the screen.

from a single track. This betrays the score print facility's origins as an aid to editing rather than a full blown feature of the program. If you import a MIDI file from elsewhere this is no problem as the whole file is assigned to one 'pattern'. If you use Pro 24 itself to record the MIDI file using its pattern features you will be unable to easily print full score from it later on, even if all the patterns are on the same track.

If we can overcome the difficulties mentioned so far Pro 24 has a number of options which greatly assist in producing a usable score (see the menu in figure 3). These include the ability to select the key signature (this doesn't actually transpose the piece, but enables you to display and print the score in the same key as within the sequencer). Full transposition can be achieved within the sequencer section proper. As mentioned earlier, you can also quantize both notes and rests in order to remove some of the spurious notes and pauses in an unquantized MIDI file. For this to be successful within the score edit facility of Pro 24 the MIDI file must be quite close to strict time. The 'loose' version of Tallis' Canon mentioned earlier could not successfully be transcribed within this part of the program. I would again suggest that the best way is to get the MIDI file right before trying to transcribe it. There are some other options enabling overlapped notes to be tied and something to do with syncopes which I don't understand!

Once the transcribed score is on the screen it is possible to do a limited amount of editing of notes (pitch and length can be changed. Notes can also be deleted or copied to another part of the score). Irritatingly, it is not possible to edit or delete individual rests as you can with notes, only globally through the score quantize feature.

Once all these steps have been taken you have a passable score on the screen (figure 4). Getting it on paper is another matter. I possess an HP DeskJet and an Epson LQ 2500. Neither of these very common printers is supported by Pro 24. It is understandable that this should be so with the DeskJet, still in its infancy when Steinberg stopped developing the program. What is less understandable is Pro 24 not supporting Epson 24-pin output. Pro 24 does support Epson 9-pin and NEC 24-pin printers. I drove my Epson 24-pin in 9-pin mode and was presented with output which was adequate rather than wonderful.

All in all, the score printing facility of Pro 24 is not and was never intended to be a major function in itself: it is an assistant to the sequencing process. If your expectations are not too great then you will not be disappointed. It may suffice for the home pianist and budding composer, but will soon become a limitation for many people. Pro 24 cannot add embellishments such as hairpins to denote diminuendo, etc., nor can text be included, and these further limit its usefulness to the ambitious composer.

Copyist Apprentice

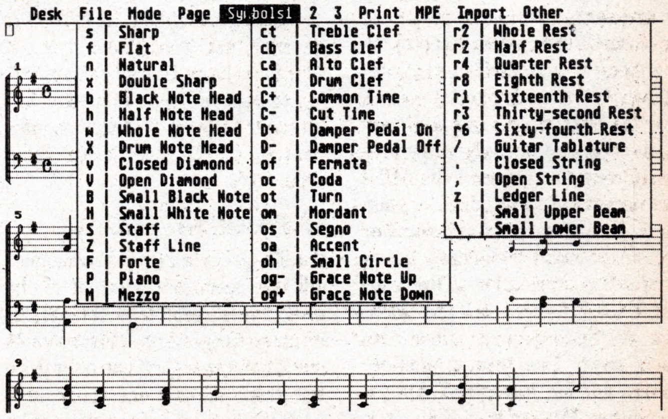
Copyist is in a different league when it comes to producing a printed score, not surprisingly as it is dedicated to that task. Multi-part scores utilising up to 24 tracks, producing up to two musical staffs from each track, are possible. Mind you, although a major orchestral work would be possible given these specifications it would not be advisable with Copyist Apprentice as it is limited to five printed pages. Big brothers, Copyist Professional and Copyist DTP are required for such major pieces.

Copyist produces a score from a MIDI file using a two-stage process. Firstly, the MIDI file is converted into an intermediate 'stream' file and this is then read by Copyist to produce the score. At each stage a goodly number of options is provided to enable the score to be transcribed correctly. Figure 5 shows the Options screen for translating the MIDI file to a stream file. Figure 6 displays the range of options which can be set when reading the stream file to the blank manuscript page. Clicking once on each option produces a local sub-menu with the range of possibilities for that option. The range of options give very good control over what appears on the manuscript. Copyist also has the ability to further edit all aspects of the score once it has been transcribed to the screen, and to add a wide range of musical symbols, including guitar chord boxes, and text for vocals. Figure 7 is a composite screenshot of the three menus of symbols which can be added to the score.

If Copyist is left to its own devices and fed a 'loose' MIDI file the resulting score is a confusion similar to that produced by Pro 24 undertaking the same task. By judicious use of the many transcribing options, and the provision of a tight MIDI file to begin with, a first class score can easily be produced. The task can be a little long-winded because of the two stage process. However, once the stream file has been produced the second Options screen (figure 6) can be adjusted each time you re-read the stream file to the blank manuscript page, making the process of producing an acceptable score less painful and time-consuming than it may seem at first glance. Copyist produced a very acceptable score. It suffers from the same difficulty with splitpoints as Pro 24 if using a single track MIDI file as your source, but will happily produce a proper treble and bass piano stave from a MIDI file with left and right hand playing on separate tracks. One curiosity of the score I produced was Copyist's insistence on grouping the notes in bars as though the piece was played in 3/4 time, despite the transcribing option being set to 4/4. Pro 24 had correctly transcribed the same MIDI file with no difficulty in this respect. Maybe if I read the manual...

Printers supported include Epson FX and LX emulations and, in version 1.6 being reviewed, the HP Deskjet via a separate utility. The output to the Deskjet was excellent in quality but very slow, taking 20 minutes or so per page.

This section on Copyist is shorter than my comments on Pro 24. This is in inverse proportion to the abilities of the respective programs to produce a printed score as I have spent a good deal of my time writing about Pro 24's drawbacks. Copyist dealt with the small task I presented to it easily (once I had produced a good MIDI file) and could do much much more. The number of features in Copyist are too extensive to deal with in an article like this. I haven't even touched on Copyist's capabilities as a music DTP program, without using MIDI files at all. My guess is that this program, in the company of your favourite sequencer,



s	Sharp	ct	Treble Clef	r2	Whole Rest
f	Flat	cb	Bass Clef	r2	Half Rest
n	Natural	ca	Alto Clef	r4	Quarter Rest
x	Double Sharp	cd	Drum Clef	r8	Eighth Rest
b	Black Note Head	C+	Common Time	r1	Sixteenth Rest
h	Half Note Head	C-	Cut Time	r3	Thirty-second Rest
w	Whole Note Head	D+	Damper Pedal On	r6	Sixty-fourth Rest
X	Drum Note Head	D-	Damper Pedal Off	/	Guitar Tablature
v	Closed Diamond	of	Fermata	.	Closed String
V	Open Diamond	oc	Coda	,	Open String
B	Small Black Note	ot	Turn	z	Ledger Line
H	Small White Note	om	Mordant	|	Small Upper Beam
S	Staff	os	Segno	\	Small Lower Beam
Z	Staff Line	oa	Accent		
F	Forte	oh	Small Circle		
P	Piano	og-	Grace Note Up		
M	Mezzo	og+	Grace Note Down		

△ Figue 7

A composite screenshot showing the wide range of musical symbols which can be used in a score produced by Copyist.

would handle almost any task the average church musician or choirmaster could legitimately throw at it.

Conclusion

Both programs did the relatively simple job I wanted them to do. Pro 24 was pushed to the very limits of its capability to do so, but it succeeded, with a question mark over the quality of its hard copy. Copyist Apprentice was barely ticking over and produced excellent copy. The buyer must make his/her own choice as to the appropriate program. Pro 24 plus Copyist is quite a formidable combination, despite their relative antiquity. One significant drawback to both programs is that it is not possible to export the score as a graphics file for use in DTP programs. If you intend producing your own hymn book you would be well advised to look at better appointed software than this.

As I write this article cut-down versions of Cubase and Notator, the market leaders in professional sequencer/scorewriting, are beginning to appear from around £100 each. This is still expensive but if they retain even a fraction of the facilites of their big brothers they will be well worth considering. The pocket money musician, however, is still limited to finding Copyist Apprentice on the secondhand market. Pro 24 will do for score printing but only just; it is fine for the dabbler in MIDI but even the moderately ambitious will soon become disillusioned with its facilities in this respect. I hope the day will come when a good and simple new product is available at an affordable price. If you are considering buying your first or even a second ST for music use you might be attracted by the Music Master package. If your primary requirement is for a printed score you might be better advised to by a Starter pack expanded to 1 Mb memory and to shop around for the scorewriter and sequencer which suit your needs.

Summary

Points for Pro 24 (as a score writer):

✓ Task of transcribing MIDI file can be carried out in the one program.

Points against:

✗ Only very basic scores can be produced, popular printers and graphics file output not supported.

Points for Copyist Apprentice:

✓ Excellent range of options, editing facilities and output quality.

Points against:

✗ Requires separate sequencer for MIDI work, graphics file output not supported.

Joe Clemson runs the Atari ST Christian User Group. Tel: (0434) 220283.

Product:........Steinberg Pro 24 III
Publisher:........Steinberg, but no longer supported
Availablity:......Part of STE Music Master pack at £399.99 RRP from Silica Systems, or secondhand.
Manifest:.........185pp spiral-bound manual, one disk and copy protection key (dongle).
System:...........Any ST with minimum 1 Mb memory, high or medium resolution display, MIDI keyboard usually required.

Product:........**Dr.T's Copyist Apprentice**
Version:...........1.6
Publisher:........Dr.T's Music Software
Availability:.....£94.95 from Softmachine in Sunderland or secondhand.
Manifest:.........111pp A5 ring-bound manual and two disks (copy protected)
System:...........Any ST with minimum 1 Mb memory, hard disk recommended but usable on floppy; high or medium resolution display.

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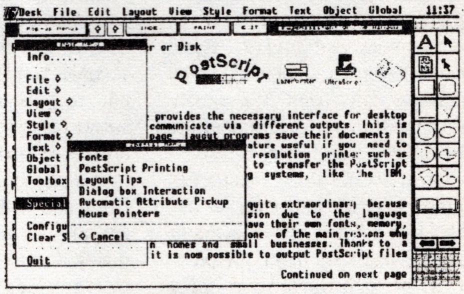

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DSP Fundamentals

We all know that the Falcon computer contains a Digital Signal Processor, but what exactly is a DSP and what can it do for the typical computer owner? William Hern explains all.

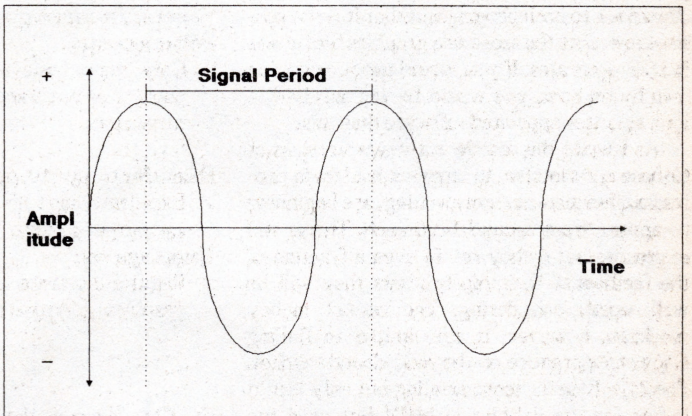

Figure 1: Wave Parameters

There can't be many ST owners who don't know that the new Falcon machine contains a Digital Signal Processor (DSP) or that it is a specialist co-processor chip that can perform certain types of calculation very quickly. However, that is about as far as most people's knowledge goes about DSPs. In this article I'll try to remove some of the mystique surrounding DSPs, explain the theory behind signal processing and take a close look at the DSP chip that Atari chose for the Falcon, the Motorola 56001.

Signal processing crops up everywhere. Anyone who has seen the movie "Who Framed Roger Rabbit?" will remember the piano duet scene with Donald and Daffy Duck and the unbelievably fast piano playing. Recording the music for this scene was a major headache for the producers. No human could play the music at the speed required and using conventional techniques to speed up the recording would also have caused the pitch of the notes to rise, spoiling the illusion. Digital signal processing was the answer and a DSP was used to produce the speed up in the music without causing any change in pitch.

Signal theory

Before we can look at DSPs, we had better define what we mean by a signal. A signal has two parameters: frequency and amplitude (Figure 1). The frequency of a signal is the number of times that the signal varies in a second and is inversely proportional to the length of time between signal peaks (this length of time is called the signal's period). Amplitude is a measure of a signal's strength (for an audio signal we would refer to this as loudness).

Signals can represent anything. As long as you have data which have numeric values that vary over time, you can display them as a signal. So in addition to the obvious signals, such as radio and sound waves, you could also have data such as population changes or variations in electricity output from a power station treated as signals. This means that the signal manipulation techniques that will be described later have applications well beyond their obvious uses.

Many common signals such as audio and visual are analogue in that they are continuous over time and can have an infinite number of values within a certain time frame. Obviously for processing with a digital computer, we need some way of converting the analogue signal into digital data. This is done by a process known as sampling which measures the signal's amplitude at regular time intervals (Figure 2). The shorter the interval between measurements, the more accurately the sampled signals waveform resembles its analogue counterpart. Another important factor in the quality of the sampling is the number of values used to represent the signal's amplitude. As with sampling rate, more is better.

The Generic DSP

In many ways digital signal processors resemble standard microprocessors. They can be programmed, access the computer's RAM and react to inputs received from outside. Where DSPs differ is that they are highly optimised for a small set of operations. In this section I'll look at some of the techniques used. This optimisation comes at the cost of flexibility though - although you could use a DSP as a general purpose microprocessor it would probably be slower than the mainstream chips. Think of a DSP as the processor equivalent of a Formula One racing car - very fast on specially designed racing tracks but not much use for day-today trips round town.

Because DSPs commonly deal with real time data, it is vital that the chip can process the data fast and efficiently. To achieve this aim, DSP designers have optimised the chip architecture, instruction set, and interrupt handling for typical signal tasks and added a number of unusual address modes.

The most successful way to speed up an operation is to provide a dedicated unit on the chip that performs the task. As the multiplication operation is so common in digital signal computations, most DSPs dedicate a significant proportion of their chip area to a multiplication unit, allowing the operation to be done within one instruction cycle. This is in complete contrast to most general purpose processors which take many cycles to do multiplication.

Another way to increase throughput is to have specialist instructions which perform complex operations that would require many instructions on more conventional processors. An example is the weighted sum calculation which involves averaging the last i values in a signal to influence the next value and is used for tasks such as noise reduction. To boost the speed of this calculation, many DSPs include an instruction which performs the calculation x1 * x2 + x3 -> x4 where x1, x2, x3 and x4 are values stored either in registers or memory addresses. Typically x3 and x4 are the same location.

To allow efficient access to stored data, DSPs have some unusual addressing modes. Going back to the weighted sum calculation, this operation requires fast access to the last n values. A good way of storing these values is in a circular buffer which is like a normal array but when the pointer into it moves beyond the furthest element, it is reset to point at the start again. A number of DSPs have a special addressing mode which implements this and proceeds as follows. First the DSP looks up a value at a location pointed to by a base address and offset. The offset is then incremented to point to the next address and if the address is outside the buffer then the offset is reset to zero. All this is done within a single cycle.

The strangest of the address modes is probably reverse bit. Here, the processor treats an address as if all its bits were inverted. So for example the address 61 (111011 in binary) would be treated by the processor as if it were address 4 (000100 in binary). While this mode may seem to have no use, it is in fact extremely useful for Fast Fourier Transform computations and allows a DSP to perform these calculations up to ten times faster than equivalent RISC processors.

As DSPs must operate with real-time data, the use of interrupts must be carefully governed so that the chip's processing capacity is not seriously reduced. To control interrupt overhead, most DSPs put tight limits on the number of instructions that can be executed for an interrupt, typically two or three. As most interrupts are triggered by data arriving at one of the processor's ports and require only to be copied somewhere into the on-chip memory, this is not too great a restriction.

Given the vast quantity of data that DSPs must be able to process, it's a tall order to equip a DSP design with sufficient bus capacity to move data around the chip efficiently and without bottlenecks. It's very similar to the problems that would face a city architect trying to incorporate a six lane motorway through a busy city centre. A common solution is known as Harvard Architecture and involves having separate buses for data and program code. Some DSPs chips go further than this and provide two buses just for data which means that two operands can be fetched simultaneously from memory and sent to the processor.

One final point to remember is that DSPs come in two flavours - fixed and floating point. Fixed point DSPs are simpler to design and so are cheaper than their floating point counterparts. To see why, consider trying to multiply 2 * 10^22 by 4.5 * 10^(-13). Floating point DSPs must have very large shifter units which can shift the bits of the two numbers involved until they are correctly aligned. This is very expensive both in terms of chip space and design complexity. Fixed point DSPs however place greater responsibility on the programmer to ensure that calculations do not cause overflows or underflows.

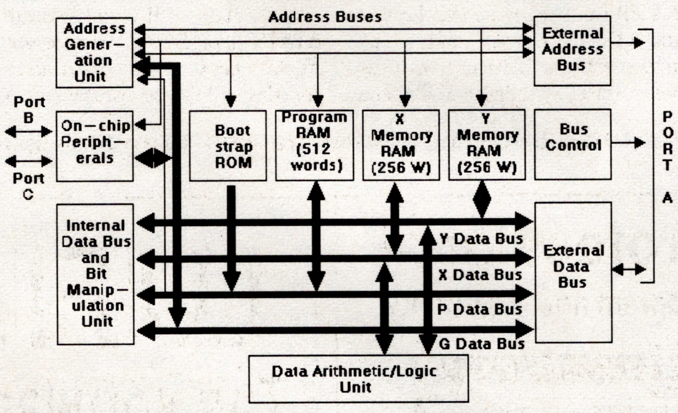

Figure 3: The Motorola 56001 DSP

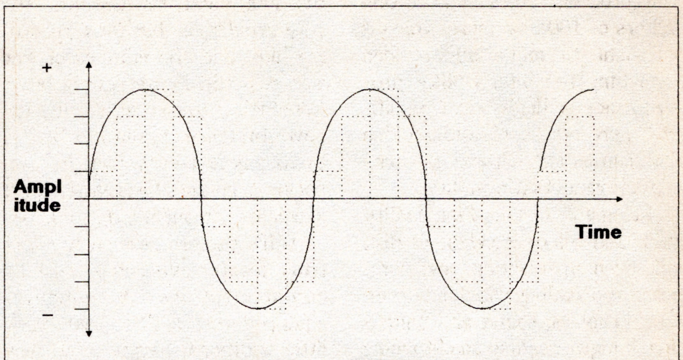

Figure 2: Sampling an Analogue Signal

The Motorola 56001

So what about the actual processor that Atari chose for the Falcon, the Motorola 56001? This is a well established DSP and was used in the original series of NeXT computers. The 56001 processes 24-bit data and has two internal accumulator registers, each 56 bits wide so that precision is preserved over many iterations of a calculation. Figure 3 shows the internal layout of the processor.

The 56001 has three Input/Output ports, labelled A, B and C. Port A is 24 bits wide, is bi-directional and is the primary route for digital signal data in and out of the chip. Port B is connected to the Falcon's DMA (Direct Memory Access) subsystem and allows the DSP to both read and write external memory. Port C is actually made up of two serial ports and supports various communication standards and is used for communicating with other peripherals. The maximum transfer rate is 5 megabits per second.

The 62-strong instruction set for the 56001 includes maths, logical, bit-manipulation, loop and program control operations. The chip can access up to 192 kilowords (a word is 24 bits long) of memory for use as either code or data. On-chip, 512 words of memory is provided which is used to store the interrupt code and small DSP programs. If the DSP code is too large to fit in internal memory and so is stored in outside RAM, then the internal memory can be used as a cache to store frequently referenced code or data. There is also a total of 512 words of memory for data which improves performance by allowing data to be fetched in advance before it is needed.

Applications of the DSP

Probably the first application that most people think of for DSPs is audio processing and Atari themselves have been heavily promoting this aspect. One of the Falcon demos used at recent shows has the machine acting as a graphic equaliser for a hi-fi unit. Although it's unlikely that you'll want to ditch your stereo's graphic equaliser in favour of your Falcon, it is a real indication of the degree of signal manipulation power that the 56001 can provide.

Courtesy of the 56001, the Falcon is capable of CD quality sound output. The big problem is the quantity of disk space needed to store the sound. A CD quality audio recording requires 44,100 samples per second per channel. As each sample may be 16 or even 24 bits long, the total disk space required to store just one second of stereo sound could be a quarter of a megabyte or more. That's nothing though when compared to the storage requirements for television quality video - one minute of video can take up over 500 megabytes.

Yet again DSPs can come to our aid as they can efficiently and quickly compress/decompress the data. Readers of my Desktop Discussion column will remember that I mentioned lossless compression back in the January 1992 issue. There is another sort of compression, lossy, which while losing some of the data in the compres-

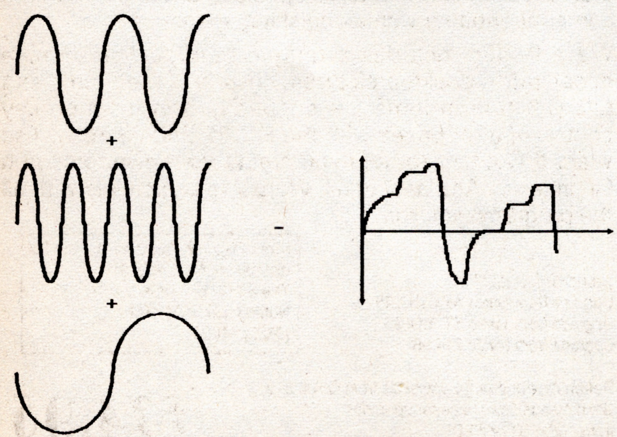

Figure 4: Simple Signals Merge To Form Complex Ones

sion process, offers compression factors of 100:1 or more which is sufficient to make audio/video recording feasible. Unlike program code or English text, significant percentages of audio/video data can be lost without any perceptible reduction in quality.

Being able to store high quality audio and video recordings on disk will open up exciting new computer applications which integrate text, graphics, sound and animation. Imagine reading an electronic copy of a manual which in addition to containing normal digitised photographs also had short segments of video footage on hand to illustrate the particularly difficult or important actions.

Another application for DSPs involves the use of Fast Fourier Transforms. Underlying the FFT is the Fourier Theorem which states that any signal can be described as the sum of a number of single frequency sine waves of various amplitudes (Figure 4). This could, for example, allow a sound recording of an orchestra to be broken down into the sounds of the individual instruments. The only problem is that for a recording like that, the number of sine waves would be unfeasibly huge. Nonetheless this is an enormously powerful tool as it allows a DSP to break any signal down into its component parts and then reassemble it in whatever manner is desired.

DSPs also promise a new era of truly inexpensive computer telecommunications. A computer equipped with a DSP needs very little additional hardware to perform the modulating/demodulating operations that today have to be done by stand-alone units. Dubbed 'soft modems', all the sound processing is done in software rather than with hardware as in conventional modems.

The first soft modem was announced in June 1992 at the New York PC Expo. The specification was impressive - throughput of up to 57,600 bits per second, V.32 bis, V.42 bis data compression, Group 3 V.29 fax support, MNP level 5 and AT command set - and was all implemented in software with the help of just two chips, a DSP and a modem front end. The cost of all this? A mere $30.

Conclusion

Was Atari right to put a DSP chip in the Falcon? It was a brave move as the only previous machine to include a built-in DSP was the NeXT computer. To put an expensive specialist chip into a so highly price-sensitive machine as the Falcon was quite a gamble. Whether it pays off or not depends on how quickly software houses come up with software that supports it.

Atari won't have the market to themselves for long. It is no secret that Apple has been investing considerable resources into incorporating DSPs into their Macintosh systems for some time now. In conjunction with the telecoms giant AT&T, Apple are working on ARTA (Apple Real Time Architecture) which is a real time multitasking and multiprocessor signal processing extension to the Mac architecture. Based around AT&T's 32 bit DSP3210 processor, Apple hopes to release Macs incorporating ARTA before the end of 1993

IBM is also showing considerable interest in DSPs and has teamed up with Texas Instruments to produce a product called MWave which is a plug-in board for PC compatible machines. Although MWave is based around a less powerful processor than used in either the Apple or Atari products, IBM is working hard to produce good development tools so that it is easy for major software houses such as Lotus, Microsoft and WordPerfect to add DSP support to their products.

DSPs have been called the maths co-processors of the 1990s. With the increasing emphasis on multi-media, the computers of tomorrow will have new and more demanding tasks. As DSP chips are a very cost effective way of supplying the power to tackle these applications, it is likely that most computers by 1995 will be supplied with them. It's great to see Atari being a trend-setter - let's hope that it pays off for them as the inclusion of MIDI ports did for the ST.

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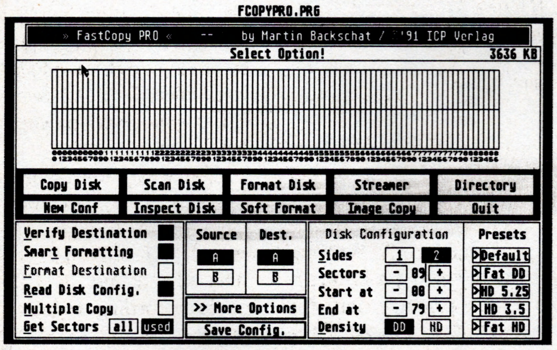

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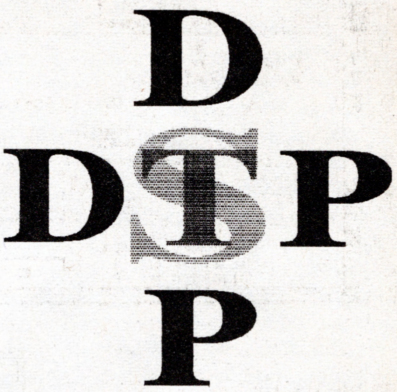
Desktop Publishing with the Atari ST



In a major new series for ST Applications, Günter Minnerup goes where the manuals fear to tread: everything you ever wanted to know about professional-quality DTP on your ST.

Part 1

Nobody in their right mind would go out, buy an ST with a MIDI lead, a copy of CuBase and a keyboard and regard himself a musician. Yet, going by the printed evidence, there are quite a few punters who, having acquired an ST along with a copy of Calamus, PageStream, Timeworks Publisher or whatever, are quite happy to consider themselves desktop publishers. Unfortunately, most people's visual sensitivities are not as developed as their aural ones, and so the perpetrators of ill-designed printed matter tend to get away with it more easily than anyone offering similarly artless "musical" output would - fortunately, abused typefaces do not scream like abused notes.

But just as most people are quite capable, given a little encouragement and training, of becoming reasonable musicians, it is also possible to learn to produce pleasing printed pages. The graphic designer's product may be called artwork, but you do not need to be an artist to do a competent job any more than you need to be one to play decent tunes on a keyboard. With both, competence is largely a matter of avoiding mistakes, be they duff notes or gross design errors. Mastering the basics and playing it safe are sound strategies to adopt for the budding desktop publisher as much as for the beginner musician.

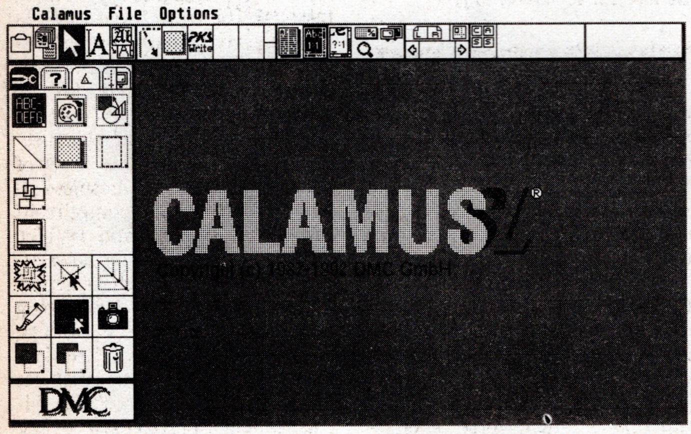
Expensive books

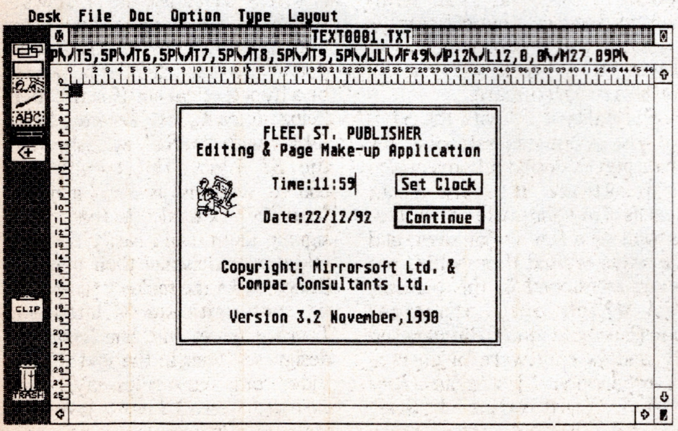
There is, of course, no shortage of books to turn to for advice on page layout and typography. The DTP boom has attracted publishers and authors keen to relieve the novice page designer of the odd tenner or two in return for expert guidance through the jungle of picas and ems, folios and bleeds, halftones and separations. Most of these books are expensive, some of them are good, a lot of them indifferent. The better ones will discuss the basic principles and then take you through some example projects step-by-step, while the poor ones are little more than showcases of successful design - interesting, but you can get the same for free by just walking through newsagents and bookshops with open eyes.

All of them, however, have the same drawback as far as we ST owners are concerned: whenever these books get down from their lofty designer heights to the actual nitty-gritty of working with a computer, they talk about Apple Macs and PCs and their associated software (Quark XPress, Aldus PageMaker, Ventura Publisher). Not surprisingly, given its small market share in the professional DTP sector, the Atari ST rarely gets a mention. This does not mean that such books are useless for us, since many of the basic techniques are quite similar whatever the system is used, but it does limit the extent to which you can sit down in front of your ST and work your way through the examples, hints and tips, and workarounds provided.

My first aim in this new series of articles, therefore, is to fill the gap created by the absence of an ST-oriented guide to good practice in desktop publishing. Good design and technical proficiency go hand-in-hand: there is no point in developing design ideas which cannot then be implemented because of hardware or software restrictions, but equally, knowing all the features of your setup inside-out will not by itself lead to quality output without sound design ideas. So, while taking you through the principles of good design, this series will always be conscious of the possibilities and limitations of existing Atari machines and programs.

Since there are several major DTP applications available for the





FLEET ST. PUBLISHER
Editing & Page Make-up Application

Time:11:59 Set Clock

Date:22/12/92 Continue

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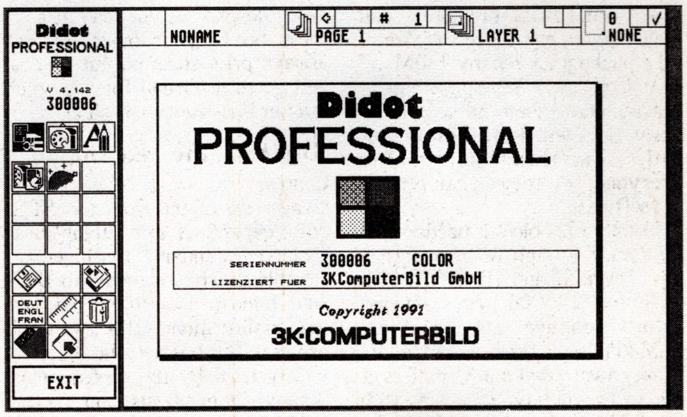
Version 3.2 November,1990



V 4.142
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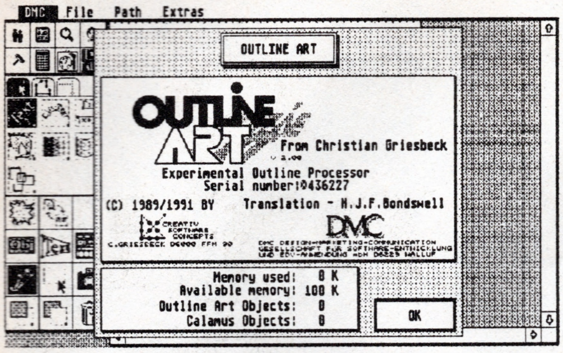
Three of the top five Atari desktop publishers: Calamus SL and Didot Professional are the most expensive and powerful, closely followed by the much cheaper PageStream (not shown here) which, however, is an American product and not very well supported in the UK. Fleet Street Publisher 3 went down with Robert Maxwell's Mirrorsoft, but is still widely used and very good on accurate typography. Timeworks Desktop Publisher (also not shown here) may be at the low end of the market, but is quite capable - after all, ST Applications is produced with it!



OUTLINE ART

OUTLINE ART

From Christian Griesbeck

Experimental Outline Processor
Serial number:0436227
(C) 1989/1991 BY Translation - H.J.F.Bondswell

DMC

Memory used: 0 K
Available memory: 100 K
Outline Art Objects: 0
Calamus Objects: 0

CompoScript

CompoScript
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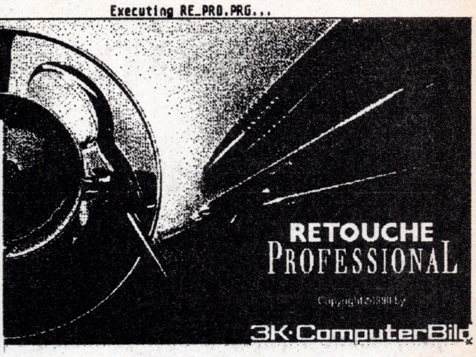
A. Fahrig, K. Hinsen, Lincoln&Co, C. Stamm, J. Zabell

Version 1.02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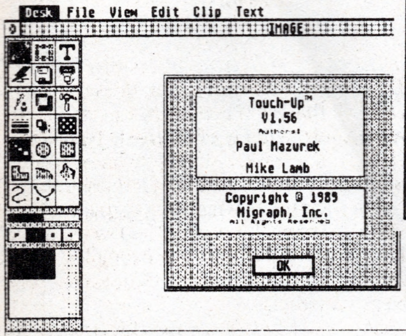

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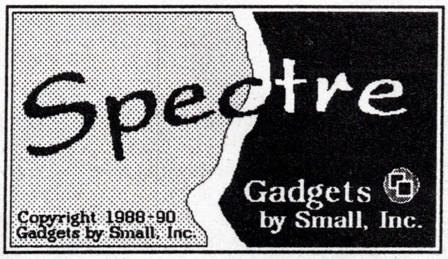

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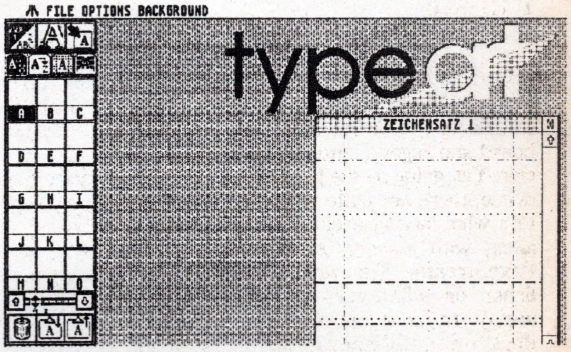


Alongside the main page layout application, you will need a number of other programs for specialised tasks. Here are some I use regularly: Outline Art and TypeArt for creating and manipulating Calamus vector graphics and Calamus fonts, TouchUp for IMG clip art, Retouche Professional for editing and screening scanned images as well as photomontage. CompoScript is invaluable for turning your Atari laser into a PostScript printer - either for final output or for proofing PostScript files before sending them off to an imagesetting bureau - and the Spectre GCR Apple Macintosh emulator comes in handy for communicating with the No. 1 industry-standard machine for DTP.

ST, the articles will not be software-specific. It is assumed that you have read your manuals and that you are reasonably familiar with what the software has to offer and how it works. It is not, in other words, a series for raw beginners but for those who, having mastered the basics, are now looking to improve the quality of their work to the much-coveted "professional" standard. This can be done with all the main DTP programs for the ST, from Timeworks Publisher to Calamus SL. The screenshots and practical hints and tips proffered will, of course, inevitably reflect my own experience and my own preferences - I am more familiar with Calamus, Fleet Street Publisher and Didot Professional than with Timeworks Publisher and PageStream, and given the size of DTP packages, even my 140Mb of combined hard disk space cannot accommodate them all simultaneously. But I will do my best to provide something useful for everyone, whatever your preferred software.

Another problem is hardware: I am lucky enough to own both a 4Mb Mega ST and a 6Mb TT, with an Epson GT6000 greyscale and colour scanner and an Atari SLM804 laser printer, but I am keenly aware that many readers of the series will have machines with less RAM, floppy disks only, and a dot matrix printer for output. I do happen to believe, though, that serious DTP is impossible without a hard drive and an output device superior in quality to dot matrix. It is possible, with some ingenuity, to make do with floppies but you will be on your own as far as this series is concerned if you try. But dot matrix printers, even the 24-pin species with a notional resolution of 360dpi, are simply too coarse to reproduce quality typefaces and graphics. They are also slow, noisy and notorious ribbon-gobblers. But don't despair if you call one of these beasts your own: you can always print their output to disk and go to a bureau for top-notch laser or imagesetter output.

Anything the Mac can do..

Contrary to what Mac and PC owners might tell you, the ST is quite capable of everything these "industry standard" machines are capable of when it comes to DTP. And I mean everything, without any qualifications - this series will prove it. But because the ST is not widely used by the professionals, because its hardware and operating system were not really designed with professional use in mind, because third-party manufacturers of crucial peripherals do not see the ST as a worthwhile market, and because the software houses involved are small and under-resourced outfits compared with the large corporations of the Mac and PC scene, achieving the same results often involves a much more tortuous road. To give just one example: Mac and PC publishers have instant access to the vast library of commercial PostScript fonts. By contrast, users of the most popular ST desktop publisher, Calamus, are restricted to the comparatively small range of Calamus fonts unless they are prepared to convert PostScript fonts themselves, an enterprise fraught with potential difficulties. The situation is much worse when it comes to high-end peripherals such as scanners, optical storage media, and large-screen monitors - making them work with the ST can be a real nightmare.

So quality DTP with the ST is not just about understanding the principles of design and mastering your software. It is also about dozens of niggling little difficulties, as well as a few major ones, and the ways around these which are never mentioned in the manuals and which only practical experience can teach. Having used STs and their software for years in the production of just about every kind of printed matter - business stationery, leaflets, posters, technical manuals, newspapers, glossy magazines and books - to all kinds of specifications - from simple black-and-white to full colour, from laser prints designed for photocopying to 2540dpi films and bromides - I have accumulated quite a few such workarounds which I hope to share with you on these pages.

Where is this journey going to take us? The truth is concrete, as they say, so the more general discussion of all the problems and challenges arising from desktop publishing on the ST will be accompanied by work on a collection of real-life projects: a set of stationery for a small business including letterhead, compliment slip, business card and invoice form; a magazine-style newsletter; and a book. Such "example projects" often suffer from being contrived, and there is nothing worse in making design decisions than a vague brief, so we shall not take some fictitious business selling "widgets" but one that every reader of ST Applications knows - the ST Club itself. Hence the magazine to be designed is the one you are reading, and the book will be a hypothetical one (for the time being, at least...) on "Desktop Publishing with the ST", published by the ST Club. The trouble, of course, with using these genuine "real life" examples is that redesigning them could easily be mistaken as criticism of their existing design, so let me make it clear that no such criticism is intended. There is never just one "correct" design solution: in the end - provided some basic rules have been followed - it is all down to taste and personal preferences.

Beginners' Forum

This month, Mark Baines starts a new column where you, the reader, can ask for assistance with your general computing problems.

We are well aware from letters and conversations that many readers are struggling with the concepts and practices that others take for granted. This regular column is aimed at these people and beginners alike. Every month I will deal with the questions and misunderstandings common to the novice, although it is hoped that all readers will find something new, for we are all learners. The content and the direction this column takes is up to you, so send me your ideas and problems.

Printer Drivers

I start with an old chestnut. Paul Glover tells me that the most frequently asked questions he has to answer are those to do with printer drivers, especially why drivers from one package can't be used with another. First, the background.

Printers

Printers come in various formats - dot-matrix, laser, inkjet, bubblejet, electrothermal, electrosensitive, daisywheel. These groups are subdivided themselves. Dot-matrix printers, for instance, can have 8, 9, 18, 24 or more pins that are struck against the inked ribbon and paper to form an image based on a matrix or grid of possible dots. 9-pin printers form larger dots than 24-pin printers and the smallest vertical and horizontal movement a print head can move will also vary. All these factors determine the resolution of a printer. An NEC P series printer can output at 360 x 360 dots per inch, a 9-pin printer may manage 120 x 144 or 240 x 216dpi. On top of these physical variations manufacturers introduce features in order to make their printer attractive in a crowded market. Text attributes, such a bold, italics, underline etc. are usually taken for granted but each make of printer can have different fonts and styles of characters which increases the differences between printers. Similar factors affect the other types of printers all of which perform different physical and electrical feats to produce the final output.

To control the output of the printer, codes are sent from the computer selecting the various attributes and styles. Dot-matrix printers normally conform to a subset of Epson's escape code sequences but with many of these codes reflecting the differences between the printers. Laser printers usually emulate various other printers, the standard being Hewlett Packard PCL5 and HPGL or PostScript. Epson and IBM Proprinter emulations are also common. The accuracy and extent of these, even PostScript, varies.

So, it is to be appreciated that sending any control code from a computer to a printer may or may not do what you expect. Routine commands will normally work, the control code 'ESC 4' (27; 4) is universal in switching on italics in a dot-matrix. A common code to vertically move the print head a certain amount can be another story.

Output

The diversity of programs is greater than that of printers. Most programmers see different ways of implementing similar things. All programs producing output onto paper have to enable the user to set up the overall appearance of the text or image. These 'commands' may be inputted in various ways - mouse-drawn lines in a CAD program or characters typed at the keyboard. All this input and associated commands form the data file to be printed, your .DOC, .IMG or .CDK file. These tend to come in two forms, text files and image files.

The most common type of output is a text file. All printers (except the Atari laser printers) have code within their ROMs which contain the data necessary for them to print various character sets. Straight ASCII files printed directly to a printer will appear in the same font and style with no margins on any of the four sides. Introducing formatting codes into the text determines its layout, fonts and attributes.

These programs can enable the user to set the attributes and layout of the text in different ways. Most programs have the codes embedded within the text unseen to the user. Usually, some character, symbol or WYSIWYG type display will represent that formatting. The resulting file saved to disk consists of the characters of the text with these codes inserted between them and can be viewed with a disk or file editor.

In Figure 1, a Protext screen is shown displaying a text file with codes inserted for bold and elite characters. Notice that the 'bold on' code is an inverse b character. Figure 2 shows that same file displayed as hexadecimal and ASCII characters in a disk editor (BED by L J Patton). The cursor is shown at the position of the first hexadecimal code for Protext's 'bold on' command, 05 E2. Preceding it are the carriage return and line feed characters 0D (decimal 13) and 0A (decimal 10). If we investigated the document files of every word processor we would find different codes within them for the 'bold on' command. There is no standard for these formatting codes inserted by a word processor program. What is especially evident is that the Protext code for 'bold on' is not the same as the Epson standard code controlling the printer which in hexadecimal is 1B 45.

The second type of output file to a printer is an image file, either a bitmap image, such as an .IMG file or a vector image, such as an Easydraw .GEM metafile or CAD file. A printer can only use bitmap files and so before a vector drawing is printed it has to be converted into a bitmap - that is, a series of 1 and 0-bits arranged in a pattern that directly relates to the dots in the image to be formed. The way these bits are sent to the printer is totally different to that of sending text. Text is sent as a stream of bytes, one byte for each character to be printed and one or more bytes for the formatting codes inserted within them. Images are sent as streams of bits and positioning codes, determining the positions of the print head and paper or the laser on the drum in a laser printer. With dot-matrix printers, positioning those pins accurately varies according to the resolution of the printer, which we have seen depends on the number of pins and the smallest possible movements of the print head horizontally and vertically.

So why the printer driver?

You may now begin to realise why programs need various ways of communicating with printers all of which behave differently. It is important to understand that a printer driver file (such as a 1st Word .HEX file, GDOS .SYS, Protext or Calamus .CPD, etc.) is inactive and nothing more than a data file. It contains the information necessary for a specific program to translate its output commands into codes that a specific printer can understand. Many people start with the misconception that the printer driver 'drives' or works the printer, that it is actively sending commands to the printer. It is the output program - the word processor, desktop publisher, graphics program or the GDOS OUTPRINT.PRG - that is controlling the printer, not the printer driver which is an intermediary, an interface between the program and its data and the printer. If you look at the printer driver as a translator, then things become clear.

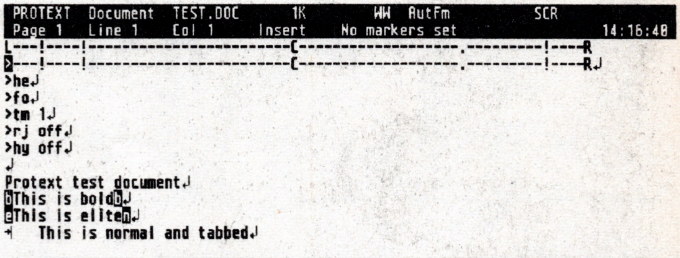
Look at Figure 3. It shows the same text file in Figure 1 printed in the printer's hex mode. Most printers have a means of printing its output as a series of hex numbers. This is useful for debugging programs and analysing document files. Look in your printer manual for how to do it and print a text file to see how the control codes from within the word processor change into control codes that the printer can understand. I have outlined the escape code sequence for 'Bold on' 1B 45 1B 47 and added an ASCII text display at the right to show the corresponding text. 1B 45 are the codes for enhanced mode on and 1B 47 for double-strike mode on. Also outlined are 1B 46 and 1B 48, ESC F and ESC G, for turning these modes off. Notice how these codes differ from those embedded within the Protext document file in Figure 2. You see, how they have been translated? Other codes are shown which, with the aid of your printer manual, you might be able to interpret.

What all this means is that you can't swap drivers between programs. You can't use the Protext printer drivers with 1st Word or the Timeworks GDOS driver with Calamus. There are no universal printer drivers, not even GDOS drivers. There is nothing that can be done about this sad situation except to buy a PC with Windows 3 or an Apple Mac! There are some advantages though. A text file written with a word processor will usually print out on any printer simply by changing the printer driver. The document doesn't need any editing to change the commands and styles. This is, however, of no consequence to most users with only the one printer.

Why do we have this situation? I think that we all have to share the blame, unfortunately: Atari - who at the very beginning should have established guidelines for programmers and provided better documentation; programmers - who develop their own interfaces and output routines for speed and convenience; users - for demanding and accepting that software.

If you can think of anything that I ought to cover in this column then send me a letter, but please remember that I cannot deal with specific program and hardware problems unless it appears to be of common interest.

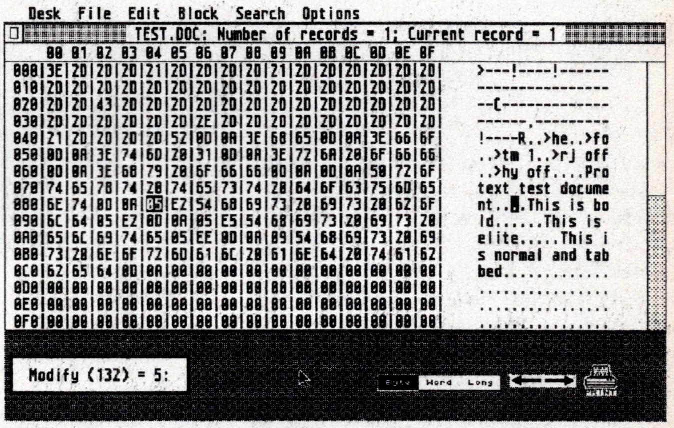
Mark S Baines
Beginners' Forum
Linnhe
Shore Street
Inver, by Tain
Ross-shire
IV20 1SF



```
 PROTEXT  Document  TEST.DOC       1K        WW  AutFm           SCR
 Page 1   Line 1    Col 1      Insert    No markers set             14:16:40
L---!----!-----------------------C-------------------.----------!----R
>---!----!-----------------------C-------------------.----------!----R↲
>he↲
>fo↲
>tm 1↲
>rj off↲
>hy off↲
↲
Protext test document↲
bThis is boldb↲
eThis is eliten↲
→   This is normal and tabbed↲
```

△ Figure 1

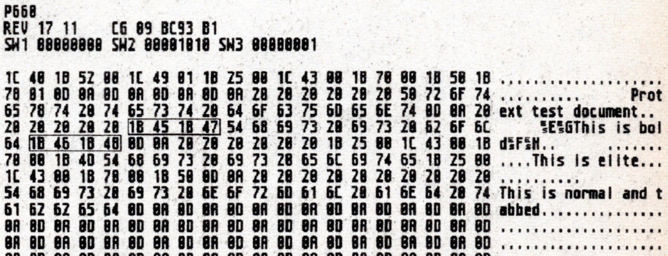
Protext screen showing text file with attribute codes inserted.



```
TEST.DOC: Number of records = 1; Current record = 1
    00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
000|3E|2D|2D|2D|21|2D|2D|2D|2D|21|2D|2D|2D|2D|2D|2D|     >---!----!------
010|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|     ----------------
020|2D|2D|43|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|2D|     --C-------------
030|2D|2D|2D|2D|2D|2D|2E|2D|2D|2D|2D|2D|2D|2D|2D|2D|     ------.---------
040|21|2D|2D|2D|2D|52|0D|0A|3E|68|65|0D|0A|3E|66|6F|     !----R..>he..>fo
050|0D|0A|3E|74|6D|20|31|0D|0A|3E|72|6A|20|6F|66|66|     ..>tm 1..>rj off
060|0D|0A|3E|68|79|20|6F|66|66|0D|0A|0D|0A|50|72|6F|     ..>hy off....Pro
070|74|65|78|74|20|74|65|73|74|20|64|6F|63|75|6D|65|     text test docume
080|6E|74|0D|0A|05|E2|54|68|69|73|20|69|73|20|62|6F|     nt..█.This is bo
090|6C|64|05|E2|0D|0A|05|E5|54|68|69|73|20|69|73|20|     ld......This is 
0A0|65|6C|69|74|65|05|EE|0D|0A|09|54|68|69|73|20|69|     elite.....This i
0B0|73|20|6E|6F|72|6D|61|6C|20|61|6E|64|20|74|61|62|     s normal and tab
0C0|62|65|64|0D|0A|00|00|00|00|00|00|00|00|00|00|00|     bed.............
0D0|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|     ................
0E0|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|     ................
0F0|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|00|     ................

Modify (132) = 5:
```

△ Figure 2

The same Protext document file as saved to disk and analysed by a disk editor.



```
P660
REV 17 11    C6 09 BC93 B1
SW1 00000000 SW2 00001010 SW3 00000001

1C 40 1B 52 00 1C 49 01 1B 25 00 1C 43 00 1B 78 00 1B 50 1B ....................
78 01 0D 0A 0D 0A 0D 0A 0D 0A 20 20 20 20 20 20 50 72 6F 74 ..........      Prot
65 78 74 20 74 65 73 74 20 64 6F 63 75 6D 65 6E 74 0D 0A 20 ext test document.. 
20 20 20 20 20 1B 45 1B 47 54 68 69 73 20 69 73 20 62 6F 6C      ␛E␛GThis is bol
64 1B 46 1B 48 0D 0A 20 20 20 20 20 20 1B 25 00 1C 43 00 1B d␛F␛H..      .......
78 00 1B 4D 54 68 69 73 20 69 73 20 65 6C 69 74 65 1B 25 00 ....This is elite...
1C 43 00 1B 78 00 1B 50 0D 0A 20 20 20 20 20 20 20 20 20 20 ..........
54 68 69 73 20 69 73 20 6E 6F 72 6D 61 6C 20 61 6E 64 20 74 This is normal and t
61 62 62 65 64 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D abbed...............
0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D ....................
0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D ....................
0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D ....................
0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D ....................
0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D 0A 0D ....................
```

△ Figure 3

The same file as printed by Protext in hex mode. Notice that the text remains but the codes between it changes.

Grafix Arts

Paul Keller

TECHNIQUE – Detail

This is my favourite part of any painting or computer art work. But it is certainly not everyone's preference, mainly owing to the seemingly tortuous work involved. The painstaking patience you need to create something like the graphics standard found in the 'Bitmap Brothers' games is a challenge in itself on any ST 16-colour art package.

It is this level of 'detail' which gives such games as 'GODS' or 'ZENON 2' a cutting edge in the market place. Their detail helps to give them more realism than those games which lack it. This level of knowledge in computer art on the ST doesn't come overnight unfortunately, but with a little patience and by applying some of the techniques in our Grafix Arts column you will definitely be improving your abilities in creating such professional art on your ST.

Resolution

Each of the three resolutions the ST offers has its own strengths and weaknesses. High resolution, while offering more pixels and so a much higher resolution, only offers you two colours (black and white). It is best suited to line drawings or black and white only illustrations.

Medium resolution offers you more pixels and a higher resolution than 'low' but you can only have a maximum of four colours on screen from your global palette of 4,096 or 512 colours. It is best suited to producing colour visuals for logos or text applications which need overlaying onto video. It can also be used most effectively for monochrome work, e.g. using four shades of grey to produce an illustration, or four shades of brown, etc. I would recommend anyone who has not yet used this resolution for any work to at least try experimenting in a little more detail with it in their own art creations, as occasionally it can be a better choice than low resolution for more detailed work.

Every ST artist must at some time have worked in low resolution. It offers the user the greatest flexibility, 16 shades chosen from your larger global palette. Ideal for those multi-coloured illustrations you love to draw, the drawback is that the resolution is low and it shows if you don't do any tidying up.

Computer rendering

The solution for the ST artist who doesn't want the trouble of spending a great amount of time doing the detailed work himself is to get the computer to do it for him!

Some art packages will do anti-aliasing for you and this will effectively improve the visual resolution and hence the detail of your pictures. I would recommend the use of two art packages for this, SPECTRUM 512 has the best anti-aliasing capability I have seen on the ST (best suited to ST/M/FM computers as they have only a 512 global colour palette). Deluxe Paint with a global palette of 4,096 colours is best suited to the STE computer. Use these packages on the **finished** design or creation and you could save hours on such detailed work as anti-aliasing. But if like me you find that even this form of enhancement is not enough detail then you have to get in much closer to your work, and the ZOOM tool is best suited for this job.

Zoom

The power of this tool can vary greatly from computer art package to package. The better art packages not only allow different levels of zoom but also the use of other tools within the zoom window, such as cut and paste, fill, etc. It is also useful to be able to see size for size the area you are changing at the same time as working in the zoom window. This will save you time in constantly exiting and re-entering the zoom window to see your current changes. The level of the zoom you use is down to preference but an obvious guide is to use a greater zoom for more detail. If you have not extensively used the zoom function before it would be a good idea to get hold of a finely detailed picture and view it in such a mode. You will probably be surprised with what you see when you realise that the graphic artist has had to work with such large dots to create his masterpiece. For my own work I like to change the levels of zoom from time to time as a great deal of concentration is needed in the higher modes. For instance, one dot in zoom mode could represent a person's eye in size-for-size detail.

Contrast

This has been mentioned before, but is a very important aspect in any detail you may wish to create in your pictures. For in reality it is the use of this contrast which helps to create detail. Positioning of pixels in zoom mode determines the effectiveness of any such enhancements made. For example, keep lighter shades near lighter boundaries and darker shades near darker boundaries. This grouping of contrast levels forms part of an anti-aliasing trick, but goes beyond this because you can use many more similar colours to generate the illusion of working in a higher resolution than when used in anti-aliasing alone.

Brushes

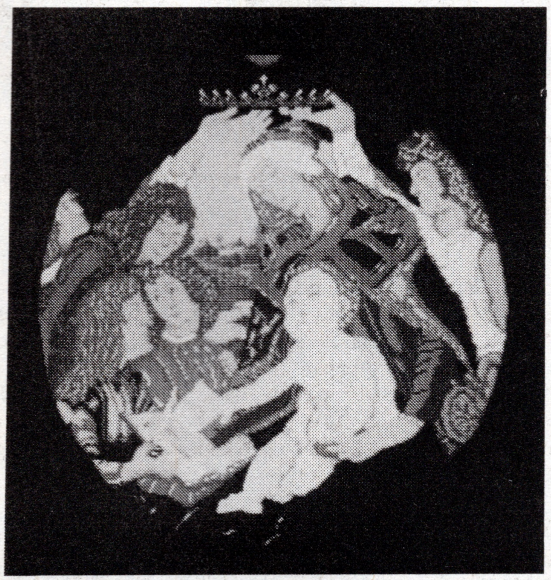
A good choice of brush for detail is the single dot, for unlike other brushes it does not get in the way of your picture by annoyingly covering up the parts it is resting over. It is the main brush I tend to use, but if not available in an art package I am using, then I will utilise the cross hair type as my second choice.

As for a real brush when drawing, I think the majority of us use the mouse as our drawing tool, as the 'Mark 4 Cherry Drawing Tablit' is a bit hard to swallow at £534.63 - but if you've the money phone 0582 763100. The main advantage in using such a tablet is in the drawing of the picture outlines, which can obviously save a great deal of time and it will accept up to A3 artwork for tracing. It comes highly recommended by professionals involved more in the field of CAD than by ST artists interested in obtaining greater accuracy in their drawings, and a choice of puck or pen is available for drawing with. A cheaper alternative for most ST art enthusiasts is to buy a second mouse such as the Naksha device. These mice give a higher accuracy than the standard mice supplied with the Atari range of computers and this higher resolution means you don't have to claw with your mouse when moving from one side of the screen to the other. The extra speed and smoothness they provide make art creation a little more enjoyable, and a mouse mat to go with your mouse will also help save on wear and tear of your wrist as well as mouse! As a final note remember that the more detail you wish to put in your pictures the more time you will also need to spend working on them. This is essentially because you are working with more dots or pixels on an individual picture than if you were drawing in normal size and view.

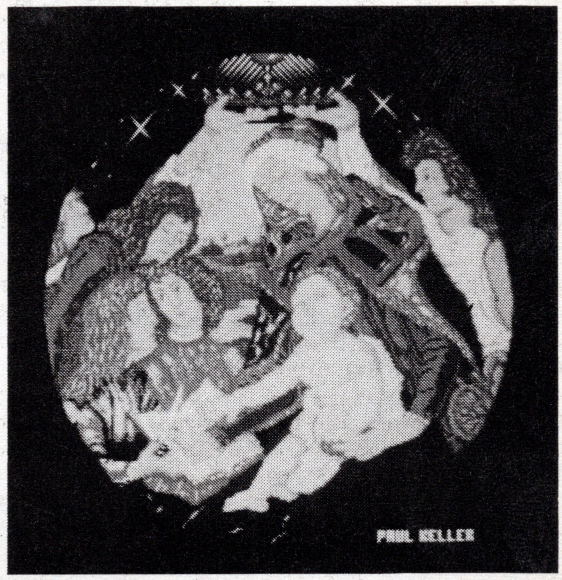
Next Month: Horizons

On the box

MADONNA OF THE MAGNIFICAT



(5) In this stage the grid is no longer needed. I worked on one half of the crown at the top of the picture, and then using the 'BLOCK' command the other half was 'FLIPPED' and pasted down. This 'BLOCK' command was also used to create the face on the far left of the picture; it was 'COPIED', 'ROTATED' and placed down, with only very minor enhancements being made. All ANTI-ALIASING was carried out in 'ZOOM' mode by hand. The higher definition on the eyebrows, etc., was due to such techniques. I usually like to use at least two shades other than the background and foreground colours being worked on. If a line is more horizontal I may use up to five shades as well as the background and foreground colours to eliminate 'JAGGIES' and give a higher definition.



(6) Highlights and shadows where created on the baby giving a more three-dimensional look. I added text to the book, most of these dots only being randomly but strategically placed to give the impression that it was text. I wanted to liven the picture up more and added the stars to the arches to give the impression of heaven. Also I reduced the size of the baby's head, as it looked just a little too big, using the 'BLOCK' command and 'PRESIZE' to get a more realistic size. Finer details were added, and general tidying up carried out.

By using a higher 'ZOOM' mode I got a lot more detail in the picture, but the picture took me longer to draw because of this.

Next Month: Butterfly 1/2

TOOLS - Airbrush

The airbrush tool offers a great flexibility in the different effects which can be produced with its use. On the ST with any art-related computer software the effect will never be exactly the same as a real-life one. But the greater flexibility the computer offers should more than make up for this if you are only drawing for fun or even at a professional level and don't want the hassle of mixing inks and masking your illustrations. Most of the ST art packages available have the airbrush tool, but some differ on the use and effectiveness of its application. The better implemented airbrushes are those with which you can choose both the 'nozzle flow' and 'spread' to whatever setting you find comfortable and to your liking.

If working on a large area simply select a large nozzle, and if working on a small area select a small nozzle. The relationship of the speed or flow to the spread covered should be carefully observed. For a large area spray spread a faster speed will be required than for a smaller spread.

The random generation of the dot spray is much more effective than a simple dot pattern in the use of any texture creations. This is mainly due to the fact that it is a random creation of dots and a less coarse effect is achieved by this method than with a standard texture fill pattern.

Most ST art packages also allow you to spray patterns. The effect is one of a less defined pattern - as if appearing or disappearing, useful for fog, water or any other defocused effects needed. The choice of colour in airbrushing is critical: unlike the real thing the colours will not mix on contact, i.e. spraying red on a blue background will not produce a magenta colour; instead, the spray colour blocks over the spray area. Some computer airbrushes can spray a multitude of colours at the same time, e.g. a random range of greens could be good for creating leaves of trees or shrubs, etc. If spraying with colours singly it should be noted that colours of a similar contrast offer a visually higher resolution than those which don't. An example of this might be found by spraying a white colour on a black background, also try spraying some lines of the different greys available and comparing their effects. It will be noted that the darkest grey dots look much finer than the white, and this illusion can be used to good effect in making your pictures seem to be of a higher resolution than they really are. The STE has a good advantage here, as it offers eight more contrast levels than are available on the STFM, which means an even higher degree of illusion and detail are possible. The extra shades also mean better colour integration is possible. This is the merging of a lighter shade to a darker (and vice versa) by gradually spraying layered bands of your colour range in order of contrast.

But whether you have an STE or STFM, at some time or other in one of your drawings you will find the effects offered by the airbrush tool a great time saver and definitely a fun-to-use tool!

Next Month: Lines

LAST WORDS

"Philosophy is the greatest of the gifts which the immortal gods bestowed on mortal man."

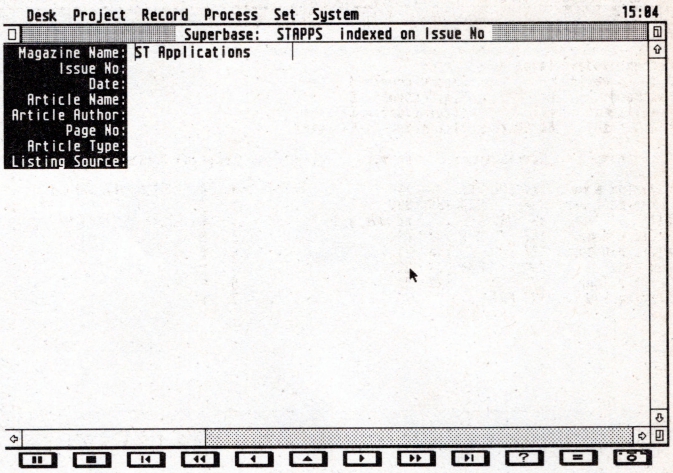
Toscanella

Superbase Personal

Tutorial – Part Two

File Definition & Data Entry

In last month's introduction to this series Mark Baines laid out the design for a record to store the details of articles contained within the ST Applications magazine. This month we put that plan into action.



Magazine Name: ST Applications
Issue No:
Date:
Article Name:
Article Author:
Page No:
Article Type:
Listing Source:

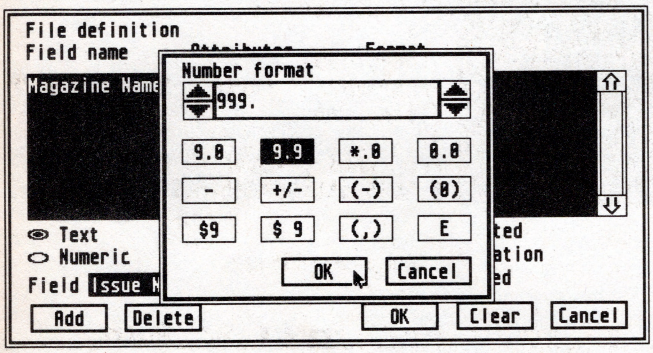
△ The first empty record

The next three articles are intended to be hands-on tutorials with you taking an active part. This is the ONLY way to learn to use a program.

The File Definition

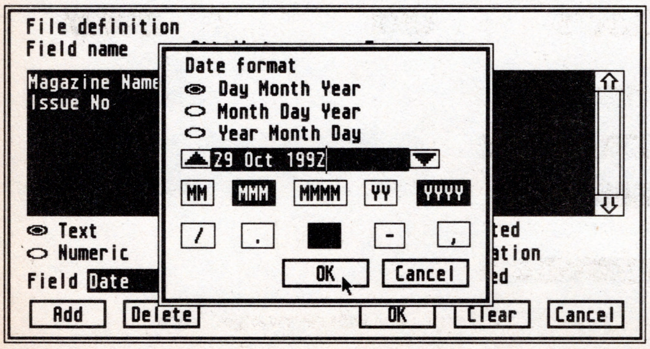
Load up Superbase. You may need to click on the Directory change item in the System menu to change to the directory where you intend to store your records. From the Project menu, select New File and then type in the name of the file. I suggest STAPPS. Do not enter a filename extender. A Password is optional - press Return if not required. You are presented with the File Definition dialog box.

The Magazine Name is a constant (until you start to add other magazines) having the value "ST Applications". To save having to continually type this when entering data you can make it a Calculated field type. Type Magazine Name in the Field input line and then click on the Calculation button. Type "ST Applications" (with the quotes) in the bottom input line and click on OK to go back to the File Definition dialog. Click on the Required button and then on Add.



Magazine Name
Number format: 999.
● Text
○ Numeric
Field Issue N

△ Number format configuration and ▽ Date format configuration



Magazine Name
Issue No
● Day Month Year
○ Month Day Year
○ Year Month Day
29 Oct 1992
● Text
○ Numeric
Field Date

Type in Issue No for the next field name and then on the Numeric button. The issue number is a whole number and won't be longer than 3 digits for some time yet! Click on the 9.9 button (for no leading/trailing spaces) and make the format at the top "999." by clicking on the left arrows to show no decimal places and on the right arrows to make it three digits. Click on OK and then Add.

The date of the issue is normally just the month and year. Superbase will also need a day and one option is to use the 1st although it makes no difference. Type in the field name Date and click on the Date button. Adjust the format to that you like best. I prefer something like "1 Dec 1992" which is the "Day Month Year" format with "MMM" for the month, "YYYY" for the year and only spaces between each item. Experiment.

After clicking on OK select the Required button. The data in this type of field could easily be entered incorrectly and so a Validation check may be worthwhile to detect a nonsense date. Note that a Validation cannot confirm that the data is correct, just that it falls outside certain prescribed values. You cannot enter the Validation details until the field has been added, so click on Add. Now select the Date field from the list by clicking on it and then click on the Validated button. ST Applications was first published in December 1990 and so we should check that any date we enter is on or after this date. Click on the Date field in the list to enter it in the main input line. Then click on the > (greater than) button and then on the Value line to show the cursor. Enter 1/11/90 and press Return to pass this value into the main formula line.

Click on OK and, back in the File Definition dialog, click on the Clear button to finish. You can't Add the field as it already exists, and clicking on OK would conclude the File Definition altogether.

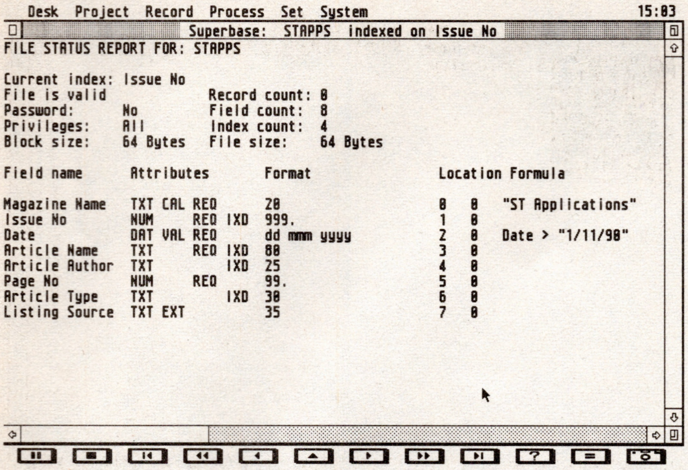
Next is Article Name. The text field needs to be 80 characters long, so click on Text button and adjust. Remember to click on the "2" of "20" and then on the up arrow six times. This field is also Required.

Enter the field definitions for the Article Author, Page No and Article Type as detailed above. You could Validate the Page No to check that you haven't entered a value over 64.

Enter the field name Listing Source and click on External button and adjust the length to 35 characters which should accommodate most pathnames. External fields are always Text fields and this is done automatically.

If you make a mistake, any field can be deleted and they are marked as such but will still remain in the File Definition until you Reorganize the file. Fields cannot be moved or inserted but can be edited at any time, even after you have entered data values into the fields.

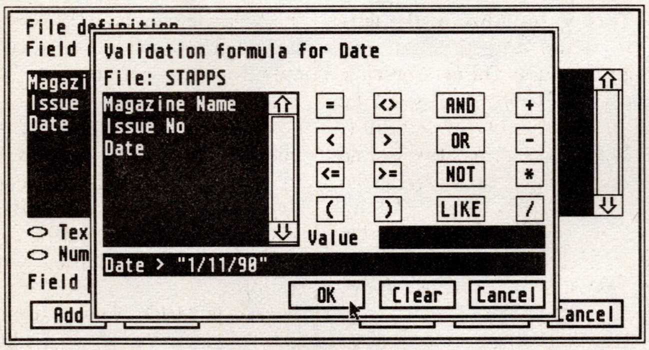
Now click on OK to finish the File Definition. We have to decide on our indexes. The primary key index would normally be a unique field but none exists in our example. Each field in any one record can contain values found in other records. The first index you


Desk Project Record Process Set System
15:03
Superbase: STAPPS indexed on Issue No

```
FILE STATUS REPORT FOR: STAPPS

Current index: Issue No
File is valid                Record count: 0
Password:      No            Field count:  8
Privileges:    All           Index count:  4
Block size:    64 Bytes      File size:    64 Bytes

Field name      Attributes       Format              Location Formula

Magazine Name   TXT CAL REQ      20                  0   0   "ST Applications"
Issue No        NUM     REQ IXD  999.                1   0
Date            DAT VAL REQ      dd mmm yyyy         2   0   Date > "1/11/90"
Article Name    TXT     REQ IXD  80                  3   0
Article Author  TXT         IXD  25                  4   0
Page No         NUM     REQ      99.                 5   0
Article Type    TXT         IXD  30                  6   0
Listing Source  TXT EXT          35                  7   0
```

△ File status report

▽ Validation formula



Validation formula for Date

File: STAPPS

Magazine Name
Issue No
Date

Date > "1/11/90"

choose will be the default index and records will be ordered on that field. It makes sense to have the records ordered on Issue No or Date, so click on Issue No as a Normal Index, then on OK. Issue No is removed from the list and as it is related to the Date there is no need to choose that value as well. If you were going to enter other magazines in the database, then the key field could be the Magazine Name or it would have to be the Date field as one magazine could have the same issue number as another but different dates. Select Article Name, Article Author and Article Type as Normal Indexes as well.

With a blank input line, click on OK to finish and all the files are then constructed on disk. After that the first blank record appears and the Magazine Name field should have "ST Applications" entered for you.

You can check the Status of the File under the System menu and may re-edit the definition at any time.

You have the choice of entering data in your records either using Record View, which is the default, or Form View. In the latter, you can drag the fields around to lay out your data entry form as you want. The length of each field is shown by the vertical bar at the end. However, the order of data entry is determined by the order of the fields in the File Definition.

You can save the Form View arrangement of fields with the Save File item under the Project menu.

Entering data values

Let's complete a record. Before we start, again you must prepare yourself and decide what information is worth storing and in what format. Do you want everything from a copy of ST Applications recorded or just some sections? Do you want to record just the title of an article or should you include extra words to help search for that article at a later date? Decide now on your policy and remain consistent. There is no point whatsoever keeping a database file if you are not going to use it and if it doesn't contain the information you need when you do. Like the initial design, this is a personal preference dependent on your own strategies of working.

As a random example I will look at one article from Issue 9 August 1991. I'll leave the rest to you for homework, or you can get the complete database from disk magazine DMG.33.

The quickest and easiest mode for entering data is in Record View mode. Obtain a new record by pressing Alt-N or use the item in the Record menu. The cursor will be placed in the Magazine Name field in case you wish to change the current value. The use of a constant in a Calculated field is the only example where you can directly edit the contents of that type of field. Press Return to move to the next field - the cursor always moves to the beginning of the next field. The cursor keys can be used when the vertical line cursor is shown (click on a field to show it) but this doesn't always place the cursor at the beginning of a line for input. You can move from one end of the field to the other with Insert and Clr Home keys, an unusual and non-standard combination.

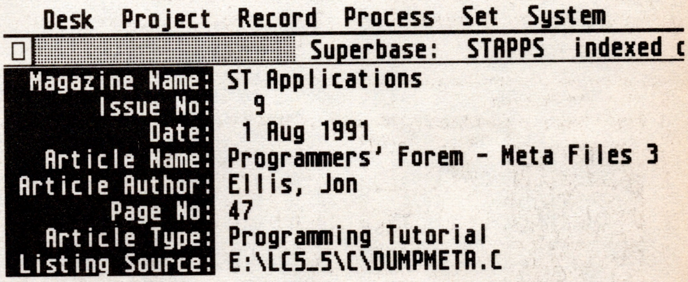
Enter 9 for the Issue No and press Return. The Date field can be entered in the format as designated earlier. However, this is cumbersome and can easily lead to mistakes. Superbase will accept the date in any format and will adjust its display accordingly, so type in 1/8/91 which is the quickest format. Notice how Superbase changes it. Press Return again. The Article name is Programmers' Forum - Meta Files 3. Here is an example of where I have provided extra information other than the title of the article.

The Article Author ought to be surname first followed by the first name. If the file is indexed on the Article Author field, the order is determined by the spelling of the surnames and not by the first names. A file ordered so that Jon Ellis comes before Michael Baxter but after Günter Minnerup doesn't make sense. Enter Ellis, Jon and 47 for the Page No.

I mentioned in part one that the Article Type is a personal preference and, for me, includes eight categories to sort or search the articles on. If I wanted a list of all the Programming Tutorial articles or Hardware Reviews this field enables that. The list I have is:

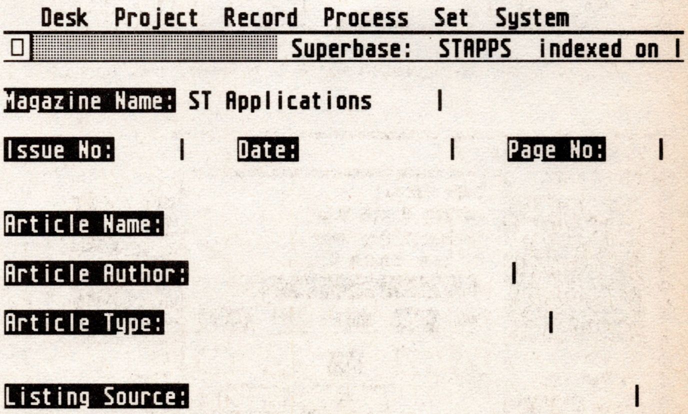
- ∗ Feature
- ∗ Software Review
- ∗ Hardware Review
- ∗ Book Review
- ∗ News
- ∗ Hints and Tips
- ∗ DIY Hardware
- ∗ Programming Tutorial

Devise your own list and if you have an accessory or other program that enables you to enter text macros for quick insertion then use that. This works well when entering more than one line if you can insert carriage returns


Desk Project Record Process Set System
Superbase: STAPPS indexed c

Magazine Name: ST Applications
Issue No: 9
Date: 1 Aug 1991
Article Name: Programmers' Forem - Meta Files 3
Article Author: Ellis, Jon
Page No: 47
Article Type: Programming Tutorial
Listing Source: E:\LC5_5\C\DUMPMETA.C

△ issue 9 record sample


Desk Project Record Process Set System
Superbase: STAPPS indexed on I

Magazine Name: ST Applications
Issue No:
Date:
Page No:
Article Name:
Article Author:
Article Type:
Listing Source:

△ Form view with re-arranged fields

into the macro. You could have a macro to enter the first three fields for each record for issue 23, say. This is a feature that would be welcome from within Superbase itself.

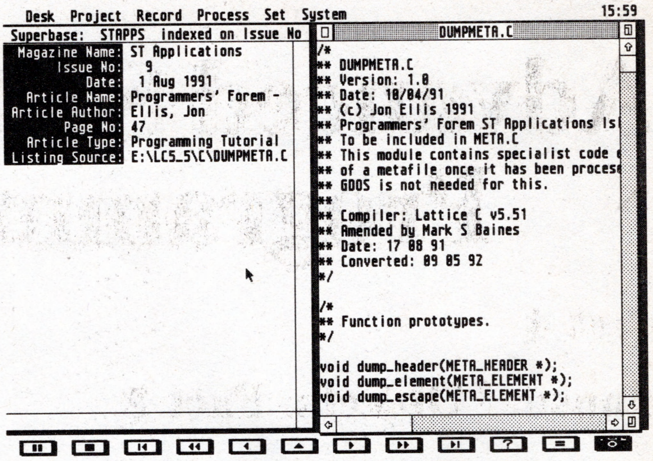
In the Article Type field, enter Programming Tutorial. For this particular record there is a source code file called DUMPMETA.C from a listing in the article. The data value E:\LC5_5\C\DUMPMETA.C in the Listing Source field enables the External File button to be clicked on and that text file found at that pathname and displayed in a window.

You may enter this or your pathname if you have this file on disk. If not then enter C as the type of language used.

The record can be saved by pressing Alt-S or using the relevant entry in the Record menu. Where records have many fields in common you can Duplicate one record and edit its details to make another, new one. Duplicate is also found in the Record menu. Don't forget to Save the record when finished.

Any existing record can be re-edited by displaying it on the screen and clicking on any field with the mouse to display the cursor. You can also use the Edit item in the Record menu or Alt-E but this is unnecessary. Again, you must Save the record when finished: don't ever assume that Superbase will do it for you. Individual records can be deleted from the file by using the Remove item. There is no UNDO function to recover the record even though it still exists in the file, so be careful. Deleted records still take up room on disk and are not fully removed from the file until the file is Reorganized. This will also speed up record searching if there are a lot of deleted records. The Reorganize option is under the System menu. When asked for a device and directory pathname, use another disk drive or directory so that your existing files remain as a backup.

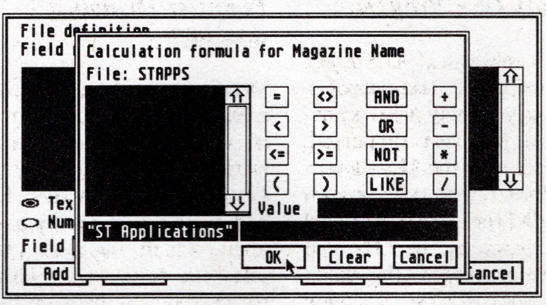
*** Next month, I will look at how to search for records.**



```
Superbase:  STAPPS  indexed on Issue No
   Magazine Name: ST Applications
        Issue No:   9
            Date:  1 Aug 1991
    Article Name: Programmers' Forem -
  Article Author: Ellis, Jon
         Page No: 47
    Article Type: Programming Tutorial
  Listing Source: E:\LC5_5\C\DUMPMETA.C
```

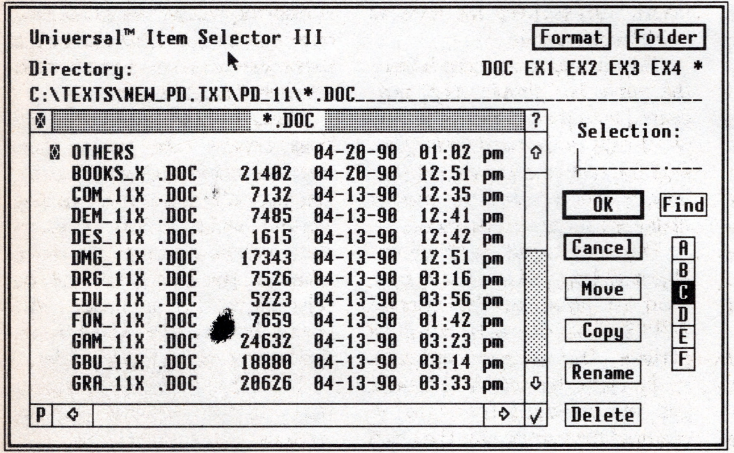
```
/*
** DUMPMETA.C
** Version: 1.0
** Date: 10/04/91
** (c) Jon Ellis 1991
** Programmers' Forem ST Applications Is
** To be included in META.C
** This module contains specialist code
** of a metafile once it has been processe
** GDOS is not needed for this.
**
** Compiler: Lattice C v5.51
** Amended by Mark S Baines
** Date: 17 08 91
** Converted: 09 05 92
*/


/*
** Function prototypes.
*/

void dump_header(META_HEADER *);
void dump_element(META_ELEMENT *);
void dump_escape(META_ELEMENT *);
```

△ Record and external file display



Calculation formula for Magazine Name
File: STAPPS
"ST Applications"

△ Calculation formula entry



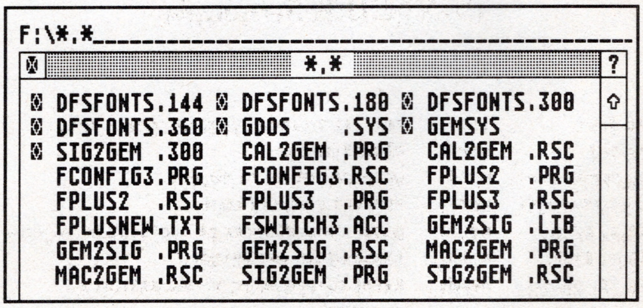
```
Universal™ Item Selector III
Directory:
C:\TEXTS\NEW_PD.TXT\PD_11\*.DOC
                    *.DOC
 OTHERS                    04-20-90  01:02 pm
 BOOKS_X  .DOC    21402    04-20-90  12:51 pm
 COM_11X  .DOC     7132    04-13-90  12:35 pm
 DEM_11X  .DOC     7485    04-13-90  12:41 pm
 DES_11X  .DOC     1615    04-13-90  12:42 pm
 DMG_11X  .DOC    17343    04-13-90  12:51 pm
 DRG_11X  .DOC     7526    04-13-90  03:16 pm
 EDU_11X  .DOC     5223    04-13-90  03:56 pm
 FON_11X  .DOC     7659    04-13-90  01:42 pm
 GAM_11X  .DOC    24632    04-13-90  03:23 pm
 GBU_11X  .DOC    18880    04-13-90  03:14 pm
 GRA_11X  .DOC    20626    04-13-90  03:33 pm
```

☐ Ignore current file name conflicts: UIS III can be forced to ignore any file name conflicts during copying or moving files
☐ Three different window layouts with two font sizes; movable UIS III window
☐ Instant free RAM report at any time
☐ New Quickpath feature: up to ten file paths may be stored and recalled on a function key or with a couple of mouse-clicks; filename may be used as filemask
☐ Full or partial directory printout with option to set form feed and left indent
☐ file show and print: control codes converted to spaces for easy viewing of WP files

Universal Item Selector III

New Features for UIS III

☐ Built-in Default Configuration Ability
☐ New Lasso Functions: bi-directional lasso with automatic window scrolling
☐ New Multiple File selections: left click with shift key or left click with right button depressed
☐ UNDO function: file operations may be aborted by pressing the Undo key
☐ Re-set or cold boot from the keyboard
☐ change file attributes: Read/write, Read only, Show, Hide & Touch



```
F:\*.*
                      *.*
 DFSFONTS.144   DFSFONTS.180   DFSFONTS.300
 DFSFONTS.360   GDOS    .SYS   GEMSYS
 SIG2GEM .300   CAL2GEM .PRG   CAL2GEM .RSC
 FCONFIG3.PRG   FCONFIG3.RSC   FPLUS2  .PRG
 FPLUS2  .RSC   FPLUS3  .PRG   FPLUS3  .RSC
 FPLUSNEW.TXT   FSWITCH3.ACC   GEM2SIG .LIB
 GEM2SIG .PRG   GEM2SIG .RSC   MAC2GEM .PRG
 MAC2GEM .RSC   SIG2GEM .PRG   SIG2GEM .RSC
```

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Advanced ST System Programming

Part 4

Unusual Objects: Part 2

Following on from last month's article, this month Andy Pennell describes a very powerful, but tricky-to-use feature of AES objects - the mysterious ProgDefs. The example program shows how to use round buttons, instead of the boring square ones.

To Boldly Go - ProgDefs

While the selection of AES object types is useful for most purposes, sometimes you may need something that just isn't supported. With this in mind the AES allows a user-defined object type, known as a ProgDef (or UserDef). Instead of being drawn by the AES, you supply the drawing routine yourself, allowing almost complete freedom for the programmer.

Unfortunately, ProgDefs are very poorly documented. Even the WERCS manual (which contains more information than any other I have seen) falls down because a bug in the word-processor used caused some of the text in that very section to simply disappear.

Every time the AES finds a ProgDef object in a tree it is drawing, it will treat the ob_spec field as a pointer to what is known as an APPLBLK structure. This itself consists of two long-words; the first is a pointer to the drawing code, the second is for your own use. Your custom drawing routine gets called with a pointer to another structure, a PARMBLK structure, on its stack, and has to use this to figure out where the object is, what state it is in, and so on.

ProgDef Drawing Routines

Writing these drawing routines is a bit of a black art - it took me a lot of trial and error to figure it out originally, no thanks to any official Developer documentation, I might add. Nowhere does it say anything about which registers you are allowed; however, being the paranoid person that I am I always save everything except D0. You are called in supervisor mode; this means you cannot make any AES calls at all. You need a VDI handle in order to draw anything, and this should be read during program startup using graf_handle. If you issue any VDI calls to change any attributes you must save and restore the original attributes - this is a real pain but is very necessary. On exit from your routine, register D0 should contain any rendering you would like the AES to perform over your object; it works in the same way as the ob_state bits. Returning zero means leave it alone.

In order to write a ProgDef drawing routine you really do need to use at least a little assembly-language; you might be able to use C or Modula-2, with a small assembly-language stub, but you need to take great care, ensuring you save suitable registers and load any base-registers your compiled code needs.

PARMBLK Structure

pb_tree	long	pointer to very start of object tree
pb_obj	word	object number
pb_prevstate	word	original state of object
pb_currstate	word	current state of object
pb_x, pb_y	words	pixel co-ordinates of top-left of object
pb_w, pb_h	words	pixel width and height
pb_xc, pb_yc	words	pixel co-ordinate of current clip rectangle
pb_wc, pb_hc	words	pixel width and height of clip rect
pb_parm	long	copied from APPLBLK structure

Round Buttons

By way of an example I'm going to show how to use a couple of ProgDefs in a dialog box to give round buttons, instead of the normal boring square ones. (Yes, I know, I'm trying to make my ST look more like a Mac again.) Owing to the very different nature of interfacing different compilers with assembly-language, this whole example is in assembler. I'm going to be using the Devpac 2 GEM macro calls to keep the code as readable as possible.

The main program code follows the norm for simple AES programs, with the addition of a couple of calls to the routine set_progdef for each of my rounded buttons. It then invokes this special dialog box in the ordinary way.

This set_progdef call finds the object address and sets its ob_spec field to point to the special APPLBLK structures (as it will be garbage after the rsrc_load call). It also finds the AES' VDI handle and the standard font size. If required the font size for the small text used in dialog boxes could be found using vq_extnd 0 call and looking in the minimum character height field, but I don't need it for this example. Note that I'm using the AES handle to find this, saving me the hassle of opening my own virtual workstation which I otherwise don't need. If you're using a resource editor which doesn't allow the creation of ProgDefs then this routine could also change the ob_type field.

The user-defined long in the APPLBLK structure I have chosen to use as a pointer to the text to be displayed within the button, or 0 if no text is required. The code at roundb_draw is the drawing routine and starts off by saving those registers it will be using and setting the current_handle variable (the Devpac VDI library works like the BASIC one, by not requiring a handle parameter to everything). It cannot call graf_handle at this point to find the handle because AES calls do not work in supervisor mode. It loads a3 with the pointer to the PARMBLK structure; immediately on entry to the code the parameter would be at 4(sp) but after saving 7 registers, 7*4 has to be added to the stack offset. The code then does the laborious chore of saving various VDI attributes; in fact those attributes which it will be setting. A drawing routine should not rely on any particular attribute being a particular value on entry; it must set everything it requires.

Having done the required house-keeping, the routine then starts actually drawing the button, starting with the box then drawing the text within it. The pb_currstate variable is used to determine whether the button should be selected or not and, just like square buttons, DEFAULT rounded buttons have a wider border.

The AES itself has a slightly more efficient way of drawing buttons - it compares pb_prevstate with pb_currstate and if they are different then optimises its drawing, for example by XORing what is already there instead of drawing it differently. If both states are the same then the AES is drawing it for the first time, and so code similar to mine is used. This optimisation is why objc_change is required to alter the ob_state field for on-screen objects, instead of simply changing the structure yourself and re-drawing.

The drawing code interrogates the VDI to determine the exact size of the text, so it works with any system font, then draws it centred within the box. It restores all the attributes it has used, then exits with D0 either being 0 or DISABLED; this is so the AES calling it performs the greying effect for a disabled button.

Debugging

Debugging custom drawing routines can be tricky, to say the least. Just when you think you've got it right you may find that it draws in the wrong colour if you have certain other types of objects before it, or in the wrong line width. If your debugger uses GEM itself, then you can forget trying to trace through a custom drawing routine.

Other Uses

The use of ProgDefs are limited only by the programmer; they can be used to simply make things prettier, like this example, or to add new features to old friends. You could use ProgDefs to use different fonts in dialogs (if you have GDOS) or to do sideways or upside-down text (if you so wish!).

ProgDef resource

One tree is required, TESTDIALOG. It can contain anything you like, so long as it has two ProgDefs, one called PDEF1, the other PDEF2. Each should be SELECTABLE and EXIT and one should also be DEFAULT.

If using WERCS, firstly place an IBOX anywhere within the form, before adding the ProgDefs, otherwise you may not actually see the ProgDefs. This is caused by an attribute bug in the WERCS drawing procedure. (They can get drawn in white, on a white background!)

If using a resource editor which doesn't support ProgDefs, add them as buttons instead, with any text field you like (it will be ignored) and add suitable code to the set_progdef subroutine to change the ob_type field.

Tricks with Dialog Boxes

Using Touchexit

If you want clicking on one item to affect the appearance of another item, say by disabling it or changing its text, make the action button a TOUCHEXIT. This means that as soon as it is clicked on, the form_do code will exit and give you the object number. You can then edit the form or re-display as required, then branch back to the form_do in your program, instead of exiting in the normal way (i.e. FMD_FINISH).

Changing Text Items

If you want to change the text of an item while it is displayed (after a touchexit click, for example) you may find that re-drawing it will not replace the old text, but merely overwrite it, producing an untidy mess. This mess is caused by text being drawn with no background, so it just gets ORed over the old text. The solution is to draw not just the object you've changed, but its parent object (normally the root object) with a clip rectangle just a little bigger than your object. Drawing the parent (normally a BOX) will clear out the old contents then draw your new one, though don't forget to make the depth at least 1. Using the clip rectangle will make the redraw much faster and unnoticeable.

Centered Text

If you would like some text centred in a box without having to go to the expense (in memory terms) of a TEXT object, use a BUTTON but don't make it SELECTABLE or EXIT.

Pretty Buttons

You don't always have to exit from dialogs by clicking on buttons; if you're feeling extravagant you can make ICONs or IMAGEs SELECTABLE, EXIT and even DEFAULT for really interesting dialogs. Don't go mad though - it's easy to eat up memory without realising it.

```
* Example showing a rounded-corner button using a ProgDef
* Assembly-language

        include gemmacro.s
        include progdef.i

* macro to calculate object addresses
OBJECT  macro   tree,object,result,scratchdreg
        move.w  \2,\4
        mulu    #ob_sizeof,\4
        lea     0(\1,\4),\3
        endm

* the object structure
        rsreset
ob_next rs.w    1
ob_head rs.w    1
ob_tail rs.w    1
ob_type rs.w    1
ob_flags        rs.w    1
ob_state        rs.w    1
ob_spec rs.l    1
ob_x    rs.w    1
ob_y    rs.w    1
ob_width        rs.w    1
ob_height       rs.w    1
ob_sizeof       rs.w    0

* various AES constants
type_tree       equ     0
type_string     equ     5
FMD_START       equ     0
FMD_FINISH      equ     3
G_BUTTON        equ     26
bitSELECTED     equ     0

* the program proper
        move.l  4(a7),a3        base page
        move.l  #mystack,a7
        move.l  $c(a3),d0       text len
        add.l   $14(a3),d0      data len
        add.l   $1c(a3),d0      BSS len
        add.l   #$100,d0        basepage
        move.l  d0,-(sp)
        move.l  a3,-(sp)
        clr.w   -(sp)
        move.w  #$4a,-(sp)
        trap    #1              shrink memory
        lea     12(sp),sp

        appl_init
        rsrc_load       #rsc_filename
        bne.s   rloaded_ok
* resource load failed
        form_alert      #1,#badrsc_alert
        bra     terminate
rloaded_ok
        graf_mouse      #0      mouse is an arrow

* initialise the ProgDef pointers
        moveq   #TESTDIALOG,d0
        moveq   #PDEF1,d1
        lea     round_pdef1(pc),a0
        bsr     set_progdef

        moveq   #TESTDIALOG,d0
        moveq   #PDEF2,d1
        lea     round_pdef2(pc),a0
        bsr     set_progdef

* invoke the dialog
        rsrc_gaddr      #type_tree,#TESTDIALOG
        move.l  addr_out,a3
        form_center     a3
        movem.w int_out+2,d4-d7
.again  form_dial       #FMD_START,#0,#0,#0,#0,d4,d5,d6,d7
        objc_draw       a3,#0,#10,d4,d5,d6,d7
        form_do a3,#0
        move.w  d0,d3
        form_dial       #FMD_FINISH,#0,#0,#0,#0,d4,d5,d6,d7
        OBJECT  a3,d3,a0,d0
        cmp.b   #G_BUTTON,ob_type+1(a0)
        beq.s   .isbut
        cmp.b   #G_PROGDEF,ob_type+1(a0)
        bne.s   .notbut
.isbut  bclr    #bitSELECTED,ob_state+1(a0)
.notbut cmp.w   #PDEF2,d3
        bne     .again          until Cancelled
* then exit
        rsrc_free
terminate
        appl_exit
        move.l  #$4c0000,-(sp)
        trap    #1

************ PROGDEF CODE HERE ***************

        rsreset
pb_tree rs.l    1
pb_obj  rs.w    1
pb_prevstate    rs.w    1
pb_currstate    rs.w    1
pb_x    rs.w    1
pb_y    rs.w    1
pb_w    rs.w    1
pb_h    rs.w    1
pb_xc   rs.w    1
pb_yc   rs.w    1
pb_wc   rs.w    1
pb_hc   rs.w    1
pb_parm rs.l    1

DISABLED        equ     8
bitDEFAULT      equ     1
G_PROGDEF       equ     24

* initialise a progdef pointer in a loaded resource
* in: d0=tree number, d1=object num, a0=paramblk
set_progdef
        move.l  a0,-(sp)
        move.w  d1,-(sp)
        rsrc_gaddr      #type_tree,d0
        move.w  (sp)+,d1
        move.l  addr_out,a1
        OBJECT  a1,d1,a0,d0
        move.l  (sp)+,ob_spec(a0)set paramblk ptr
        graf_handle
        move.w  int_out,aesvdi_handleensure we have it
* calculate standard system font height
        move.w  aesvdi_handle,current_handle
        vqt_attributes
        move.w  ptsout+2,aesvdi_height
        rts

box_coords
        movem.w pb_x(a3),d0-d1  top left
        movem.w pb_w(a3),d2-d3  sizes
        add.w   d0,d2
        subq.w  #1,d2
        add.w   d1,d3
        subq.w  #1,d3
        rts

* this is the draw code, called from the AES for each progdef
* this assumes the ab_parm contains a pointer to any text
* (or 0 if just a box wanted)
roundb_draw
        movem.l a0-a3/d1-d3,-(sp)just in case
        move.w  aesvdi_handle,current_handle
        move.l  4+7*4(sp),a3    the PARMBLK struct
* preserve the drawing mode
        vqf_attributes
        move.l  intout,-(sp)
        move.l  intout+4,-(sp)
        move.w  intout+8,-(sp)
* preserve line width
        vql_attributes
        move.w  ptsout+2,-(sp)
* and text attrs
        vqt_attributes
        move.w  ptsout+2,-(sp)  char height
        move.w  intout+6,-(sp)  horizontal alignment
        move.w  intout+8,-(sp)  vertical alignment
        move.w  intout+2,-(sp)  text colour

* we draw either a hollow one or a filled one (if selected)
        move.l  pb_tree(a3),a0
        move.w  pb_obj(a3),d0
        OBJECT  a0,d0,a1,d1
        moveq · #1,d0
        btst    #bitDEFAULT,ob_flags+1(a1)
        beq.s   .notdef
        moveq   #3,d0
.notdef
        vsl_width       d0
        vsf_perimeter   #1
        vswr_mode       #1      select Replace mode
        btst    #bitSELECTED,pb_currstate+1(a3)
        sne     d0
        and.w   #1,d0           black or white
        vsf_color       d0
        vsf_interior    #1      fill solid
        bsr     box_coords
        v_rfbox d0,d1,d2,d3     do a filled one
        btst    #bitSELECTED,pb_currstate+1(a3)
        bne.s   .done
* if not selected then do un-filled one
        bsr     box_coords
        v_rbox  d0,d1,d2,d3
.done
* draw the text, centered within the box
        tst.l   pb_parm(a3)
        beq     .notext

* it is either in black or white
        vswr_mode       #2      transparent
        btst    #bitSELECTED,pb_currstate+1(a3)
        seq     d0
        and.w   #1,d0
        vst_color       d0

        vst_alignment   #0,#3   make text easier
        vst_height      aesvdi_height

* how many pixels wide & high is this text?
        vqt_extent      pb_parm(a3)
        move.w  pb_w(a3),d0
        sub.w   ptsout+4,d0
        asr.w   #1,d0
        add.w   pb_x(a3),d0     X done
        move.w  pb_h(a3),d1
        add.w   ptsout+14,d1
        asr.w   #1,d1
        add.w   pb_y(a3),d1
        v_gtext d0,d1,pb_parm(a3)draw it
.notext
* restore everything now
        move.w  (sp)+,d0
        vst_color       d0
        move.w  (sp)+,d1
        move.w  (sp)+,d0
        vst_alignment   d0,d1
        move.w  (sp)+,d0
        vst_height      d0
        move.w  (sp)+,d0
        vsl_width       d0
        move.w  (sp)+,d0
        vsf_perimeter   d0
        move.w  (sp)+,d0
        vsf_style       d0
        move.w  (sp)+,d0
        vswr_mode       d0
        move.w  (sp)+,d0
        vsf_interior    d0
        move.w  (sp)+,d0
        vsf_color       d0

* we let the AES make it disabled
        move.w  pb_currstate(a3),d0
        and.w   #DISABLED,d0
        movem.l (sp)+,a0-a3/d1-d3
        rts

        SECTION DATA
round_pdef1     dc.l    roundb_drawaction routine
                dc.l    oktx
round_pdef2     dc.l    roundb_drawaction routine
                dc.l    canceltx

oktx            dc.b    'OK',0
canceltx        dc.b    'Cancel',0

        SECTION DATA

rsc_filename    dc.b    'PROGDEF.RSC',0
badrsc_alert    dc.b    '[3][Resource file error][Quit]',0

        SECTION BSS

* global variables

aesvdi_handle   ds.w    1
aesvdi_height   ds.w    1

        ds.l    100             stack space
mystack ds.w    1               (stacks go backwards)


* if not linking then include the run-times

        IFEQ    __LK
        include aeslib.s
        include vdilib.s
        ENDC
```

Going On-Line

Jekyll and Hyde

This month, Mark Baines develops a split personality looking at a transfer protocol with a difference.

When it comes to file transfers, most of us use the 'holy trinity' of X/Y/Zmodem. Zmodem has proved its worth many times: it is fast, intelligent and allows the continuation of aborted transfers. Are there alternatives?

Duplex

Most communication between modems is asymmetric, that is, user data is sent on a message or forward channel with a slower supervisory or backward channel used for acknowledgments and requests for repetitions. However, modems can use the backward channel for user data as well giving a symmetric duplex circuit with an up and a down channel. In this situation, users can upload files and download them at the same time. For many, such as sysops, point systems and business users, this can, at best, halve the amount of time on-line. Unfortunately, X/Y/Zmodem can't operate on symmetric duplex circuits but Bi-modem can and is available on the PC and Amiga but not the ST. Last year Vincent Partington, a popular figure on FidoNet and NeST wrote 'Jekyll'.

Jekyll is a full duplex transfer protocol whereby a user can upload and download files at the same time. A status window shows the progress of the transfers with an indication of the total throughput of data. There is data compression 'on the fly' based on the LZW compression technique which will compact any files that aren't already. Some users of offline readers don't bother waiting for the BBS to compress their messages but receive them straight into Jekyll, thus saving some time on-line. The send queue contains all the files you have selected to be uploaded or those selected by the remote user. Whilst one file is being transferred you can add another to the queue at any time.

Chat

If this was all Jekyll offered it would still be a serious advance on Zmodem, but it also provides a duplex split-screen chat mode whereby two users can 'talk' to each other whilst the transfers are in progress. Although at slow connect rates - the text jumps in spurts onto the screen - it is very usable and ideal for straight user-to-user connections between friends as well as calling up the sysop to ask him or her a question. Paging the other user with CTRL-J just doesn't ring the console bell but calls up a whole tune and flashes the screen - a wonderful touch.

A file selector can be called up with CTRL-F which replaces your own chat window. Here you can select files to send, rename, delete or view. The file viewer allows you to read files whilst transferring. If you read something of interest you can dump the current page to the other user for them to view. This will drop the transfer rate, however.

Jekyll has a built-in terminal which, although not full-blown like Freeze Dried, enables users to connect to each other easily without having to load Jekyll as an external program from within another terminal. The documents fully describe how to go about this so that even the new user to comms can get connected. These documents are some of the best I have seen for Shareware/PD programs, explaining things in a straightforward manner without the usual assumptions about the reader's prior knowledge. It has always been my belief that the programmer is the wrong person to write the user documentation for a program, being too close to it to do them justice. The Jekyll docs are written by Pascal Haakmat.

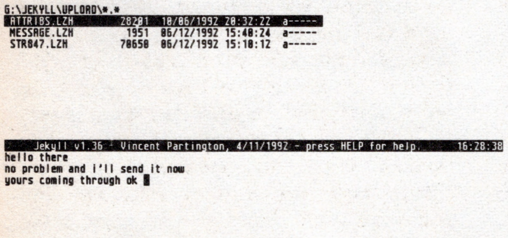
Host mode

The host mode of Jekyll allows a user to look at the drive of the host and request the files that he would like using the cursor keys and the Return key. The host can lock out certain parts of his drive from the user so that only those files he wants transferred will be. The host can then leave his computer and get on with other things, the user transferring at will. This has great implications for business users wanting to update their files, collecting and sending mail, etc., from a remote base machine.

Jekyll is a very versatile program, more than just a transfer protocol. Proper setting up needs long, cumbersome command line switches. This is solved by having a configuration file for your default settings and files containing your magics (a sort of macro/text replacement facility), function key definitions, a banner (the text you want your remote to see upon entering Jekyll), locked paths and send files list. To help with all this and in running Jekyll, Pascal wrote Hyde, a complementary graphical shell and configuration program. From here you can test Jekyll and your configuration as if you were connected to a remote computer.

Jekyll comes with Hyde and can be obtained from The Floppyshop PD library and on the networks. It is shareware and costs 25 Dutch Guilders (£10) sent direct to the author. The program is constantly updated with version 1.37 currently available and the N_JEKYLL echo on the NeST network provides support and feedback.

With more bulletin boards making Jekyll available as a download protocol this is one program with a serious future. It also encourages the file grabbers to give back something in return, and that alone makes it worth supporting.

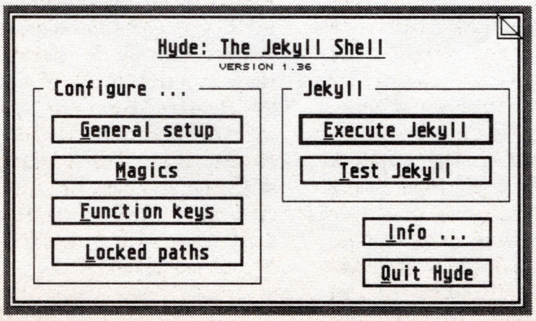


```
G:\JEKYLL\UPLOAD\*.*
 ATTRIBS.LZH          28201  10/06/1992 20:32:22  a-----
 MESSAGE.LZH           1951  06/12/1992 15:40:24  a-----
 STR047.LZH           70650  06/12/1992 15:10:12  a-----

     Jekyll v1.36   Vincent Partington, 4/11/1992 - press HELP for help.        16:28:38
hello there
no problem and i'll send it now
yours coming through ok █

                   Remote Uses Jekyll v1.36   Vincent Partington, 4/11/1992
 G:\JEKYLL\UPLOAD\ATTRIBS.LZH found
 Send: ATTRIBS.LZH       9728/  28201b  460CPS   0:06   0%
 Recv: CONFIGS.LZH       8704/  22381b  463CPS   0:05   0%
```

◁ Jekyll's split personality - receiving and sending files and showing the remote user chat window and my file selector at the top.



▷ The Hyde configuration program makes setting up Jekyll much easier.

STicks and STones

Who's that figure in the radiation-proof suit and the goggles operating a remote keyboard from the comfort of an ergonomically-designed chair, sipping orange juice and crunching vitamin supplements? It's Günter Minnerup, dedicating this month's column to the hazards of computing.

The recent publicity surrounding cases of epileptic fits being provoked by Nintendo and Sega games consoles has reminded me of a number of unresolved health issue surrounding computers in general. The console manufacturers have now been forced to issue warnings with their products: is it possible that one day personal computers will be delivered with "H.M. Government Health Warning: Wordprocessing is Bad for You" stamped on them?

The danger from the consoles is apparently something to do with the extreme states of concentration and agitation experienced by games players, which can provoke fits among a particularly susceptible minority. Somehow I cannot see wordprocessors and spreadsheets having similarly unsettling effects, unless, of course, through the contents of the files, but it would not be fair to blame the computer for that. Yet even the humble wordprocessor may not be as innocent as we assume. The cigarette packet next to my keyboard - well, yes, maybe I should give up smoking first before ranting about the health hazards of computing... carries a warning that "Smoking when pregnant harms your baby". Too much First Word Plus or Protext may not be good for the little brat either if Health and Safety at Work regulations adopted by many countries and companies are anything to go by - radiation emissions from computer screens are widely suspected of being harmful enough to exclude pregnant women from the typing pool, and limit the length of continuous exposure to them by others. Meanwhile, protective shields are a thriving business and monitor manufacturers are competing with each other on radiation emission standards like car manufacturers on clean exhaust ratings.

Maybe all this is irresponsible scare mongering, as we are often assured by "experts" who should know and have conducted scientific tests and trials. The trouble is that for each expert with reassuring findings, there is another with new cause for alarm. I am no expert at all in these matters, but experience in other fields has taught me to worry if the experts cannot agree: there is no smoke without fire, after all. And even if we could give the monitor the benefit of the doubt, what about items in the average hardware setup which all experts agree are a health hazard?

Take laser printers, for example. Like photocopiers, they emit considerable amounts of ozone which, in a closed room, can quickly build up into dangerous concentrations of this highly toxic gas. Indeed, having contracted skin cancer from excessive sunbathing outside, you may well step back into the house to poison yourself with the same sort of stuff which is getting so disastrously rare in the earth's atmosphere! Some more enlightened manufacturers of laser and photocopier engines now have ozone filters built into the machines and instruct you to replace these at regular intervals. There is no such thing in the Atari SLMs, to my knowledge, and the manuals make no reference to their existence, let alone their regular maintenance. They don't even warn you to open a window during prolonged print runs.

The toner used by the same printers is equally obnoxious: not only is it difficult to remove when accidentally spilt, but it can poison you and give you cancer - you don't even have to smoke it, since just accidentally inhaling a few particles can be quite enough. Yet only the other week, when a cartridge supplied by mail order turned out to be defective, the supplier coolly asked me to scrape the remains out of the hopper, spoon it into the original cartridge container and post it back to him for replacement!

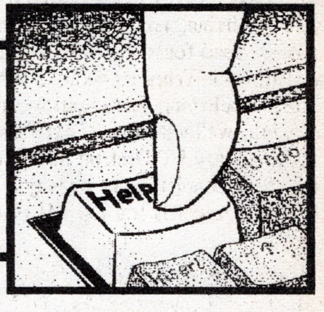
The list of potential health hazards associated with computing does not end with toxic substances, poisonous gases and radiation emissions. Computing may be a little bit like sunbathing or drinking in that there is little harm done with moderation, but excess leads to cumulative damage. I am thinking of the mysterious "repetitive strain injury", for example, an increasingly common affliction among those who spend most of their working days at the keyboard. The Financial Times is still locked in legal dispute with several of its former employees who were forced to retire with severe pains in their wrists and shoulders following the computerisation of its editorial offices. To cast the net even wider, there are those who argue that the close proximity of electrical circuits is detrimental to our health, that even standard domestic wiring can have low-level effects on our well-being of the sort which have been documented for some people living close to high-voltage overhead lines and pylons. If all this is not just the product of overexcited imaginations and hysterical technophobia, as it may well be, then I for one ask myself whether it is really such a good idea to spend hours on end, every day, only inches away from two high-powered monitors and their associated computer, printer, modem, hard disk and scanner circuitry, the whole caboodle being left to run continuously on most days.

Computers, as we all know, are addictive. All that talk of an obedient high-tech servant vastly increasing your productivity and hence your leisure time was just nonsense. Instead, computers have made me spend more time at work than ever before, much of it generated by the computer itself: there is always some more hard disk housekeeping to do, a new utility to try out, another bug to investigate, a configuration to improve, or simply something to try out. Wordprocessing makes it easier to edit copy, but has also eliminated the point where you decide that further fine-tuning would not be worth the effort of retyping the whole lot. Spreadsheets invite you to experiment with yet another "what-if" model. And when all that is over for the day, there is always electronic mail to answer, a late-night visit to the local bulletin board, or even a quick game to be played.

So perhaps we *should* worry. We worry about the cleanliness of our beaches and the lead pollution from concentrated traffic, but most of us spend far more time in front of a monitor than we do relaxing in the dunes or stuck in a traffic jam. I am pretty sure that the cigarette I am just lighting will do me more harm than the ST did while writing this column. But at least I know about cigarettes and might summon the strength to give them up one of these days. With computers, I don't know what I am letting myself in for. Maybe we should be told.

Günter Minnerup

FORUM



TeX

I TeX is the best thing since sliced Hovis, but MicroEmacs (which comes with Christoph Strunk's version) is a bit of a nuisance. How do I get it to start up with WRAP mode enabled? I'm always forgetting to key in "CTRL X-M-WRAP" before starting an editing session and then get lines that need a 160 column display! I would like to use Tempus but that costs money:-(

Geoff Wilson

I As I needed accurate and flexible contents and cross-referencing I used LaTex to produce my MSc report and so was interested to read the article in issue 23. Although I didn't need an index, the auxiliary program 'makeindx' will produce one with ease. The program produces a file which can be inserted automatically anywhere within the document. The file can be edited to tidy up any odd formatting.

David Harvey seems to be very keen on using the 'real thing' - TeX instead of LaTeX. This is fine if you can be bothered to produce your own macros, but the beauty of the LaTeX macros is that nearly no work is necessary on plain text to produce a presentable document. There are hundreds of modifying files available in the public domain (mainly in academia).

John Watkins

The Forum pages are a regular feature of ST Applications, enabling readers to exchange ideas and help each other out with problems. Whilst we attempt to briefly answer questions here, if you have additional information or ideas please do submit them for publication. What you consider to be trivial information can often be of condiderable use to other readers!

Please send your letters on disk if possible. Disks will be returned with a PD of the writer's choice. Longer submissions may appear as articles, in which case you will receive payment at our standard page-rate.

Key:

The following codes are used for each Forum entry:

J Pringle - Forum STA 20: Author who first raised the subject, and in which issue.

Q Question

A Answer

I General information or 'Input', advice, discussion, hints and tips, etc., with or without reference to previous Forum pieces.

- Editorial reply

Still Video Cameras

Q I was recently given a catalogue from HCS Global Computer Supplies - in it they are selling a Canon RC-250 still video camera (NTSC) for about £250 (if I do my sums correctly). For £629 you can buy a PC black and white version complete with digitizer board and software; same price for the Mac version. Of course, there isn't an Atari version, but have you read anywhere of something which would enable an Atari user to make use of this convenient little camera? To me, it seems an easy and cheaper way of importing the larger images into the computer than buying an A4 or A3 scanner.

Dr. J M Bowsher

● Sounds like a good idea, but in practice there are a number of problems. Unlike scanners, video cameras can introduce distortion and require correct lighting. If the camera has a SCSI interface then ICD do a suitable interface (try HCS, Power Computing, Gasteiner, or Ladbrokes); but we don't know of anything that will get the data from the camera to a suitable image file, and then you'd need some powerful editing software (Retouche?) to get the image into a usable form. There should be support for this sort of device once the Falcon starts to make progress. Maybe the best option would be reading the new Kodak CD photo system?

Timeworks 2

Jim Cruise - Forum STA 24

I Using FontGDOS with Publisher 2 causes similar problems with preceding pages being printed in the background of the current page. I solve the problem by placing a full page frame, opaqued with repel text 'on' in the background, either page by page or via the Master pages.

Another problem I have very frequently when using FontGDOS and Timeworks is a two-bomb crash or a system hang while printing multiple page documents. This problem sometimes causes damage to the disk structure which means I have to make a new startup disk. Floppy disk users will find this inconvenient but if the same things happens to a hard disk it may cause a lot of headaches! GDOS 1.1 and AMCGDOS do not have the same problem - but compared to FontGDOS they are so slow! Has anyone found a fix to this problem?

Further to Keith Rowe's article on FontGDOS, his fix for printing vector images (.GEM files) does not work every time. I still have a number of images that will not print. Has anyone found any other means of getting metafiles to print with FontGDOS and Publisher 2?

To end on a piece of good news, GST have been hiding their light under a bushel! Examination of the font archives on the Timeworks 2 master disks reveals a full set of Serif Italic fonts (SRFxxxIT.xxx) which are not mentioned in the manual nor are they in the INSTALL.TXT file. Fonts are available for all screen and printer resolutions.

The ID number follows the GST Gem font format for Italic fonts (Serif ID = 14 + 16384 [for Italics] = 16398). Examining the fonts within Fontkit shows that they have an actual ID of 14 - the other figure needs to be used in the 'ex' extract command in the INSTALL.TXT file. Users may find that they have to change the ID number of the fonts as I could not access them using the Italic option in Publisher 2 if I left the ID as 14.

Dave Mitchell

I I cannot get FontGDOS to work with Easy Text Plus and have had a huge struggle with Timeworks version one. My experiences may be of help to others in a similar situation, and are likely to be applicable to other programs.

Spurred on by the encouraging article in STA 22 I obtained FontGDOS and Trimfont from the Club. They seemed to be the answer to a long-running problem. I have a 1MB STF, with two floppy drives, and had been constantly frustrated by running out of memory when using Easy Text. I like to have a number of fonts available, and FontGDOS causes only actively used fonts to be loaded as they are needed, while Trimfont reduces the size of the font files, allowing you to put more onto disk. All seems well with Easy Text Plus until I try to print on my HP DeskJet 500. The output is always incomplete, and always includes a small box towards the top left of the page. I gave up.

I then obtained Timeworks v1 on the cover disk of an ST magazine. As a DTP program it is miles better than Easy Text Plus. After much sweat I discovered that FontGDOS and GDOS blow up if there are more than twelve lines of comment in the Assign.sys file. In addition Timeworks won't run without a couple of the smaller Swiss fonts; all the fonts must be listed in Assign.sys in ascending order of font ID, and none must be numbered above 126. Trimfont will list details of a font, including its ID number, which can be changed if necessary.

The biggest problem arose with Timeworks when loading a file. The system crashed. The reason is as follows. After installing Timeworks on a two floppy system, the main program disk remains in the A: drive, and the program prompts you to insert the fonts disk and the data disk into drive B: as appropriate. A folder on the B: drive is designated in the Assign.sys file as being where the fonts reside. Timeworks apparently expects to work with a system like GDOS, which loads all of the fonts into memory in one go. When you remove the fonts disk from drive B:, and put in the data disk (where the saved file is), there is no problem with GDOS, as all available fonts are already in memory. However, with FontGDOS, when the file is loaded, FontGDOS realises it needs to find some more fonts but Timeworks doesn't. You are not prompted for the fonts disk, FontGDOS nevertheless looks on the B: drive for the fonts, only to find the data disk and not the font disk. The result is confusion and system crash. This problem can be overcome in a number of ways.

1) Once the file is loaded, while the main program disk is whirring, quickly whip out the data disk from drive B:, and stick in the fonts disk. This works if you are quick enough, and don't fumble.

2) Make enough space on your A: disk either to store your fonts or your data files on it too. If you keep your fonts there, make sure this is reflected in the Assign.sys path.

3) Keep your data files on your fonts disk. If you compress the fonts with Trimfont you have a hell of a lot more disk space to work with. When prompted to 'Insert data disk' by Timeworks, just press OK. The data does not have to be on a separate disk. You can overcome problems with disk space by copying files from one disk to another while in Timeworks. This can be achieved by the use of a PD disk manager accessory.

4) Get a hard drive!

This problem will probably apply to any GDOS program using a similar set-up on a two floppy system.

Finally, does anybody know what AHDI.PRG does? It came with Timeworks.

Nick Gassman

- AHDI is the Atari hard disk driver software - if you answer yes to the "Do you have a hard drive?" prompt in the Publisher install program it will add a copy of AHDI to your Auto folder. Totally pointless unless you have an Atari hard drive that does not auto-boot. What version of AHDI did GST give away with Publisher 1?

FontGDOS

I The instructions for use of FontGDOS and its accompanying configuration utilities are somewhat misleading (as on DMG.32).

1) Changing printer drivers and/or fonts 'on the fly' with the Selector ACC/CPX is not as easy as it should be. As Keith Rowe noted in his article in STA 22, unless you use the 'nofonts.sys' file, the Printer Selector does some very odd things when it tries to read the Assign.sys file.

2) The Atari article advises FontGDOS users to set the miscellaneous caches in the Extend.sys file to zero as they are not used by font GDOS. Doing so results in a three bomb crash! I have set both the extra caches to '5' with no apparent effect to the printing performance of FontGDOS.

Although FontGDOS and its ancilliary applications are a great improvement over GDOS 1.1, it is a shame that these bugs have been left in the release versions, limiting their capabilities - the same old Atari story?

Dave Mitchell

Fonts and Folders

Q At the risk of seeming stupid, can you keep all your printer fonts and printer system files in one folder and rely on the ASSIGN.SYS file to pick the one for the application? I switch between Calligrapher, B/Stat, and Opus mainly, but I do use other GDOS applications occasionally. My system is currently: a 520STFM upgraded to 2.5M + blitter + TOS1.4 (many thanks to Paul Rossiter), a Progate 50DC, an SM124, and a second disk drive.

John Henderson

- Yes, with a hard drive it is a lot simpler to keep all GDOS fonts and drivers in one folder and select the set to be used at boot-up by activating the appropriate Assign.Sys file. You can automate the system further by using SuperBoot (UTI.277) to select the assign file and auto-launch the associated application.

Unsquare Blocks

Q Does anyone know of any art packages that allow uneven (i.e. not square) cut and pasting? Hyperdraw does this but won't scroll the screen over large graphics for large uneven cuts.

John Masterman

Reliable Databases

Q Can anyone recommend, from substantial personal experience, a reliable database for a 1040ST using 1.0 operating system? Re-entering data when it's lost because of a bug is really boring and I don't want to have to do it again!

Peter Leach

- Superbase Personal works well and the professional version has maintained our ST Club records for the past four years. One rider to this is that - especially when using a floppy disk based system - it is essential that you keep regular (daily!) backups with at least three generations of backups on hand should disaster strike. Databases do a lot of disk accessing and can rapidly push a floppy to breaking point.

A Link?

Q Is there any connection between the ST Club and Douglas Communications? I ask because I received a copy of DC's catalogue thingy called "Communicate" the other day, and with only two exceptions they are offering the same software as the ST Club. The adverts are even identical to those in STA. Did they use the same DTP files or just do a bit of the old 'cut and paste'?

Peter - CIX #462

- Douglas Communications sell our products and we allow them to re-use our advertising copy in their publications.

Hybrid Arts

I Hybrid Arts Inc has not gone under and left you with useless software. What has happened is that Hybrid Arts has ceased trading and sold the copyright and manufacturing rights of its ADAP hard disk systems to Digital F/X and the software copyright and manufacturing rights to Barefoot Software. This new company is run by three ex-Hybrid Arts employees: national sales manager Jeff Neideau, technical service manager Brad Cox and marketing manager Dana Byrd. Barefoot and Digital F/X will honour all Hybrid Arts warranties. Barefoot is offering upgrades for several Hybrid Arts programs.

For Hard disk recording systems such as ADAP, and renewing warranties for ADAP, contact: Digital F/X, 755 Raavendale Drive, Mountain View, CA 94043, USA. Tel: (415) 961-2800.

For all Hybrid Arts software: Editrack, EZ-Score, Gepatch, Genedit, Ez-Track and SMPTEE Track and all other Hybrid Arts sequencers, editors, etc., and renewing warranties on the above software contact: Barefoot Software, 19865 Covello Street, Canogoa Park, CA 91306, USA. Tel: (818) 727-7143.

Martin Howard Naylor

Ten Rules for PD Programmers

I Andrew South really has hit the nail solidly and squarely on the head. Unfortunately, he has made one foolish assumption - that PD programmers should use GEM. Why should they restrict themselves to this outmoded standard and force the users of their programs to follow the herd? How much more innovative to create your own operating system that is almost exactly, but not quite, totally unlike GEM. This is so popular with both programmers and users that it is almost obligatory for commercial utilities as well as PD ones.

Frank J Hollis

Multisync Monitors

Q Does anybody know if one or both of the new NEC Multisync monitors models 3FG and 4FG are suitable to work in all three resolutions with the STE, and also with the new Falcon? If so, can pin connections for the monitor lead be given?

Alec R Reed

Hard Disk Sentry

Q This program, published by Beckemeyer in the USA, appears to be very useful. I have hard disk problems revealed by the PD program Autover (DMG.30) and would like to acquire a copy of Hard Disk Sentry. I have already asked Cambridge Business Software to order it for me from America, but they have had no reply to two communications.

Do you know how to get hold of it? I ask because the latest Disk Mag (DMG.32) includes a program G_MAP which also refers to it.

Terry Dwyer

- Sorry, despite a number of FAXes and letters we have failed to get any sort of reply from Beckemeyer Developments. They do not appear to have a UK distributor either. An alternative program could be Diamond Edge, distributed in the UK by HiSoft.

Genealogy Software

I I was interested to read the article on Genealogy in the September ST Applications. Readers interested in genealogy may also like to know of two magazines that review genealogical software. 'Computers in Genealogy' is published quarterly by The Society of Genealogists, 14 Charterhouse Buildings, Goswell Road, London EC1 7BA. 'Family Tree Computer Magazine' is published quarterly by Family Tree Magazine, 15/16 Highlode, Stocking Fen Road, Ramsey, Huntingdon, Cambs. PE17 1RB.

An article in the first issue of the latter magazine gives a list of features that one should expect from a good genealogical program. Family Historians should read this before committing themselves to any particular program.

The July 1992 issue of the CompuServe magazine has an article on genealogy software and lists various databases and programs available through CompuServe. Thus there are at least 75 programs available for PC owners but there is also a section for the ST.

In addition the Birmingham and Midland Society for Genealogy and Heraldry, 92 Dimmingdale Bank, Birmingham B32 1ST has published several booklets by John Bloore which review a variety of software; also useful is David Hawgood's Computers for Family History, Hawgood Computing Ltd., 26 Cloister Road, Acton, London W3 0DE.

Finally a caution! Family history is addictive; if you start, you may never stop!

E G Richards

Cyber Studio

I Since I obtained my 1040STf at the end of 1988, my main (but not exclusive) use of the computer has been the production of three-dimensional animation using the very excellent Cyber series by Antic. In order to keep abreast of developments, I enrolled in Softline, the support facility administered first by Electric Distribution and then by GST. While I was learning to use Cybermate, the trickiest programme of the suite, I received excellent help from Softline and in particular from their Mark Emery.

As time passed, however, nothing about Cyber appeared in the Softline newsletter. Thus, when the time came to renew my subscription at the beginning of this year, I wrote to the manager, Paul Kaufman, asking if he thought it really was worth my while to shell out another £20. He replied, sympathising with my frustration and explaining that Timeworks, Antic and Migraph were phasing out their products for the ST because the machine "seems to have nosedived in the USA". He then told me frankly that he thought that, unless I was a fairly regular user of Timeworks Publisher, Softline would have "less and less interest" for me. I was very grateful for this example of honesty and candour which is not always the way with people who want our money.

Meanwhile, however, I felt very let down by Tom Hudson and his associates. When I purchased the suite, it was (to me) very expensive and I naively imagined that, like other great programmes, it would continue to go through version after version for many years. And, let it be said, it is a great series. There does not seem to be anything for the ST to compare with it. If I am wrong, I should be most grateful to hear so.

Now, of course, the ignominy is complete. The magazine Atari ST Review is going to give away the whole series month by month. It's like a slap in the face.

Perhaps something good could come out of it, however. Perhaps there are numbers of potentially interested users of the Cyber series who were put off by the high prices and who will now discover what a brilliant and rewarding series it is. If so, the resulting feedback into PD, which has been so sparse until now, will be much appreciated by us, the already converted, and, perhaps, increased interest could stimulate a British software company to produce a series of its own to replace and even to outdo the Cyber series.

Neil G Donnan

Yamaha TX16W Disks

Q Is there a way to copy MSX-Format disks on the STE? My Yamaha TX16W Sampler uses MSX-type disks. I'd like to use the STE instead of wearing out the Sampler's disk drive as I intend to sell my own disks, and so need to duplicate a lot.

Hallvaro Tangeraas

Moving Hard Drives

I For anyone else who is about to move house I would like to offer the following advice concerning hard-disks. Be very careful transporting the beast! I thought I was quite gentle enough with it, but now it refuses to boot up. The annoying thing is that it did work for a couple of hours this morning, but at the moment it is quite dead again. It may of course be due to it being 18 months old, like Keith Berry's, but the coincidence of it happening when I've just moved seems a little too much.

In answer to Keith's query on mixing GE and ICD host adaptors I can say they will chain together. My dead 45Mb drive has a GE host adaptor and my second hard disk is an old 20Mb Third Coast unit with an ICD unit. As long as I connect the GE unit directly to the ST and plug the ICD unit into the GE's output socket (and use a different SCISI ID) the GE disk boots, and then I run ICDBOOT.PRG from the desktop to activate the Third Coast unit. It doesn't work the other way around. Perhaps someone else can tell us why.

Geoff Wilson

Triangle Manual

Q I'm particularly interested in Hard Drive utilities as I'm experiencing problems with a newly acquired Triangle 40Mb non-autobooting drive (without a manual!). Has anyone got a manual?

Ian Howell

Progate Corruption

I I had a curious problem when first using my Progate drive. With one exception, the VDU display would become corrupted. The desktop was there, but somehow the sync signals were either lost or distorted. I could confirm the drive was fine when I borrowed a Philips colour monitor from a friend (but I hated med-res!). The extremely helpful Mike at Cambridge Business Software sent an alternative "lower quality" DMA cable which worked perfectly. Please print my recommendation of CBS.

John Henderson

Hard Drive Backup

Q Watching a friend using his PC Clone I was impressed to see that after each save to the hard drive he was automatically prompted to make a back-up copy of the data file to floppy. This certainly seems a better way to do it, rather than one big session once a month (if I remember!).

Are there any ST programs that offer this as standard? Or maybe a utility that would prompt the user to make a back up each time the hard drive is written to?

Mike Cliff

- Gosh - what a reliable machine... why doesn't your friend throw away the hard drive and stick to floppies all of the time? Doing daily backup session with a backup utility that looks at the archive bits of files (so that it only backs up files that have been changed since the last backup) should be more than sufficient for most users. On important documents, it can also be wise to keep backups at critical points in the job - not so much to guard against mechanical failure but to minimise the danger of destroying hours of work with an unintentional click on a delete button. (Lesson learned with Publishing Partner, which would happily print, edit, and save documents containing over 500 objects - but refused to load from disk anything with more than 256 objects.)

APL for the ST

A There are a couple of versions of the APL Language for the Atari.

One version is based on 'standard' APL and uses the 'traditional' keyboard font; but there is a new dialect called 'J' which uses the normal ASCII keyboard symbols and, to my mind, this is the way to go. The fellow to contact is:- Anthony Camacho, 2 Blenheim Road, St. Albans, Herts. AL1 4NR. Tel. (0727) 860130.

I'm sure he'll provide articles/information. The packages are cheap and well worthwhile. I think 'J' would be an excellent language for all school maths courses.

Chas Yates

- Beware: MicroAPL, being distributed by a number of PD libraries, is not PD but copyright MicroAPL Ltd.

Calamus SL Update

I You might be interested to know that I have now installed the Calamus SL update. Although the folders were in German, when loading the modules into Calamus I found that they were in English and it was easy to re-title the folders from the desktop. I must confess that apart from the irritation of the information files still being in German, which Halco assure me they are in the process of translating into English, it is much improved.

There appears to be a more stable feel to it. I now don't hold my breath when using PKS Write. Previously, for some inexplicable reason Calamus would suddenly lock up or the dreaded fatal error message would appear and you would have to re-boot. Trim and crop marks can now be used, and the tiling facility works OK.

There is a new module called "Brush". I imagine it is for retouching, but not having the English instructions I haven't yet got round to investigating it. In my opinion the Speedline module is a winner. I have managed to vectorise logos directly into Calamus despite the inadequate instructions in the manual. Alistair Craig at Halco tells me this is much improved, but again we really need the English instructions.

To sum up, from the brief use I have had with the update DMC appear to have done quite a lot of work in eliminating bugs and generally tidying the system up. There are still minor irritations, such as when calling up the Print facility. "Tray" now appears as "Kassette", but I think I can live with that!

I hope these comments will be of interest - I am a great fan of Calamus and use it professionally practically every day. I am glad to report this update appears to be a great improvement.

Peter Fitzsimons

FSP3

I There seems to be a groundswell recognition of the peerless qualities of this program, which must be the most elegantly-implemented example of a complex ST application. It is also one of only two heavily-used applications in a large collection which has never crashed on me (the other being Signum 2), in the course of type-setting entire books as well as producing training and presentation materials. If only I had bought the entire font collection; I bought about half of the Ultrascript fonts (despite Mirrorsoft's extraordinary reluctance to part with them) and would dearly love to get my hands on the rest. Would Imagen in the US be able to supply? Meanwhile the vacant slots are filling with GDOS fonts...

And yes, a support group would be welcome, if less necessary than for some competing programs - since the manual is wonderful too, index apart.

Alas, the PostScript output debugging was never completed.

John Wilkinson

Project Management

Q Does anyone know of a Project Management package (like the PC's Micro Planner) for the ST? Must have multiple projects, continuous update facilities, project merge, and graphical output. In fact, the more facilities, the better.

C E Moody

- It's the absence of software like this for the ST that sells PC emulators!

PC Emulators

Q I wish to run an IBM PC program on a 3.5" inch disk on my 1040 STFM. I have been told, rightly or wrongly, that a DOS emulator would enable me to do this. Is this correct?

M G Lee

- Compo Software (0480-891819) and Silica Systems (081-308-0888) supply DOS emulators for Atari computers.

AT Once FDD Problem

Q I have an AT-Once 286 PC emulator fitted to a twin floppy STE. The emulator works well and I have used it to run DB3 Plus, Works and Turbo C. My problem is that while discs format perfectly under MSDOS 3.3 in drive A, they will not format in drive B.

When an attempt is made to format a disc in drive B, the format process starts and proceeds correctly until I get a 'Format Complete' message immediately followed by the error message 'Error Writing FAT', and the format halts.

If a disc has been formatted in drive A, the same disc may be read and written to perfectly when placed in drive B. Both drives A and B function perfectly in normal ST mode. I am not sure if the problem is the AT-Once Emulator and/or its software, or the external Zydec drive B. Has anyone out there experienced this problem and if so have they managed to overcome it? I would appreciate any suggestions.

Jack Langford

Q For 10 months I have been using a Rocter RF302R External Drive (Evesham Micros). Occasionally, the drive does not read correctly and reports that the disk in Drive B is empty. Even when the disk is re-read it still reports 0 bytes - no files or folders. If I remove the disk, put it in Drive A and press Esc it reads as normal. When I return it to Drive B it now recognises the files as normal. Evesham have tested the Drive and they say it is alright. I am using a 2MB STE and 82/10 format disks - formatted by UIS III or Fastcopy.

I realize that it may be an Accessory or Utility that is causing the problem but each time it has happened I have panicked and forgotten to check which programs are in memory. Help!

Linda Tinkler

- FastCopy 3 has one major problem: copies of disks have the same serial number as the master disk. The ST can get confused when disks have the same serial number as it cannot detect when the disks have been swapped. This bug was squashed in Fastcopy PRO. Try installing a Forced Media Change utility (such as FMC on UTI.262) - this will ensure that the ST re-reads disks before writing to them and may well solve the problem. Next time the problem happens - grab a pencil and paper and write down details of the ACCs and Auto folder programs installed, and if possible repeat the steps that led up to the problem to see if it is repeatable.

Hot ST

Q About six months ago I installed a 4-Meg upgrade from Frontier Software. The upgrade works fine in that I can access a full 4MB when I finally get the computer to boot.

Unfortunately, when the computer is first turned on it fails to boot. In fact it fails to access any disc whatsoever: it just remains dumb and silent. If I switch the computer on for approximately five minutes and then turn it off to clear the memory and then back on again I get some reaction, usually thick black vertical lines up the screen. The problem is solved by leaving the computer turned on for approx fifteen minutes before I actually boot the computer. The trick is to turn the computer off for a few seconds and then the hard drive is turned on. The computer is then turned back on and hey presto it boots. This happens even when the hard drive is disconnected - so it is not a hard drive related problem as Frontier would have had me believe.

I think you will agree that this OK for long sessions of DTP or similar operations, but is unsatisfactory for a quick letter such as this, sometimes as many as ten letters a day.

I have had several conversations with Paul Rossiter, who I have found extremely helpful. Amongst other things Paul has suggested that it may be due to the Power Supply being fractionally low when first powered on, but adequate after it has warmed up.

Paul also suggested that I leave the computer on permanently but that approach has only resulted in my two-year old having great fun as I have foolishly taught him how to use the mouse. I am now reaching the desperation stage and maybe one of your experienced readers could come up with a solution or even a quick fix for the problem.

Andy Taylor

- A straight-jacket?

SCART

Brian Elliot - Forum STA 24

A The Peritel or SCART socket is a example of a 'standard' that is changed to suit a number of different TV manufacturers' problems.

Brian is indeed correct when he states that a pull-up on to pin 8 (Status CVBS) of a SCART socket will switch compatible TV's to external. It is apparent that not many people realize that it usually switches to Composite Video Mode.

I use my Ferguson monitor in RGB Mode. This is achieved by hard wire configuration of the retrofit peritel interface. But normally this would be achieved by a simultaneous pull up on to pin 16 (Status RGB) of the Peritel socket. This input sometimes is used for fast blanking.

Some TV\monitors require no 'pull ups' on the Peritel socket, but the selection of a specific programme number configures the set for CVBS or RGB mode.

RGB is the preferred mode, as it is the native mode for colour systems. It is when these colours are combined mathematically with an appropriate algorithm that you get PAL or SECAM or NTSC which is a transmission standard.

Steve S

Spectre GCR

Q In Issue 22 Nial Grimes recommended a shareware DeskJet driver for a Macintosh obtainable from Steve Cooper at 6618, Birchleigh Way, Alexandria, VA 22301, USA, for a charge of $20. I sent a bank draft by Airmail a couple of weeks before Christmas and received my disk on 4th January. Great Service!

My kit comprises an STFM 1040 (TOS 1.02) expanded to 4Meg of RAM, with second floppy and 40Meg hard drives, plus Spectre GCR. One of the three partitions on the hard drive has been allocated to the GCR. I have a Canon Dot Matrix printer and a DeskJet Plus with a Data Transfer Switch, running in Parallel mode.

However, Steve's printer driver runs in Serial mode. Can one of your readers help me to rejig my system so that I can continue to print my ST output in parallel mode and my GCR/MAC output to the DeskJet Plus in serial mode, preferably without having to change plugs and leads everytime.

R Chiswell

Sticking Hard Drives

Ewan Haggarty - Forum STA 23
Keith Berry - Forum STA 23
Dave Hennicker - Forum STA 24
"Anon" - Forum STA 24
Geoff Wilson - Forum STA 25
Mark Baker - Forum STA 25

I Thanks to Dave Hennicker and "Anon" for their advice on my problem with a sticky Power Computing 900 hard drive. Since my first mention of the problem in Forum it rapidly became worse, and a physical twist'n'jerk of my hard drive became an essential part of the boot-up procedure. Following Dave's instructions, I removed my Sony mechanism from the hard drive casing, and after much trembling and heart palpitation separated the PCB board from the base of the unit. This board was joined to the unit by one almost inaccessible multicoloured ribbon cable on one long side which I presume powered the stepper motor, and three very fragile looking mylar ribbons on the short end.

With the board off you can see - and turn by hand - the motor rotor itself. Initially it was very, very stiff as I turned it, then seemed to free up completely before going suddenly very stiff again. This reminded me of symptoms the Vauxhall Viva I once owned had before a front wheel hub seizure, and is apparently the result of a flattened ball-bearing jamming in its race. I couldn't quite see where Dave would have squirted WD40, but I had a go anyway, using the thin tube supplied to get at the hidden face of the rotor.

I was dead surprised when it all worked on re-assembly, but the drive still stuck and I still had to twist'n'jerk it to get it spinning. (It also now reeked of WD40 - a sure sign of an overheating and unwell bearing.) I became convinced the Sony mechanism was going to die.

Decision time. Do I:
(1) Persist with twist'n'jerk,
(2) buy a complete new hard drive, or
(3) get a new SCSI mechanism and fit it myself? (Despite Keith Berry's problems in doing something similar).

Option (3) won over (2) on cost grounds, and CD 2000 Ltd of Slough supplied me with a Conner CP30170 170MB SCSI mechanism and an IDE drive configuration pamphlet (very useful!) for £240 less VAT. (This drive had the best MB/£ ratio of all sub-200MB SCSI mechanisms advertised in the December Computer Shopper - I am a Scot after all...)

Following the instructions in the ICD Host Adapter manual it was surprisingly easy to fit the new mechanism, which spun up first time but could not be seen by IDCHECK.PRG - exactly Keith's problem. I found 3 little jumpers labelled S1, S2 and S3 near the middle of the PCB. A little experimentation showed that IDCHECK.PRG found the new mechanism at SCSI ID 0 with no jumpers, 1 with S1 connected, 2 with S2 connected, 3 with S1 and S2, and not at all in any combination including S3. Presumably with all the jumpers fitted the mechanism's SCSI ID is 7, and since the SCSI Micro Host Adapter allows only for IDs of 0 to 3, this might explain why Keith was unsuccessful.

The Conner mechanism has exactly the same footprint as the Sony it replaces, but is half the height, painted black for heat dissipation (which seems so effective I haven't reconnected the fan), and a lot quieter.

I used HARD_UP.PRG (Andy Brown - your cheque is in the post!) to do a literal data transfer from the partitions of the Sony to the new ones on the Conner. This had the effect of fooling 170Mb into thinking it was 42Mb until I realized the backup had transferred the old partition size data to the new drive. I got round this by zeroing one partition on the Conner (the most expendable - the games one), and copying the entire contents of each partition to this one, then zeroing the source partition before copying the data back into it.

It all works perfectly now, the only side-effects being me forcing myself to sit on my hands during switch-on - twist'n'jerk having become a habit - and a quieter, larger hard drive.

Ewan Haggarty

DESKTOP DISCUSSIONS

The Gospel of Gnu

GNU is more than just a collection of excellent software - it is a set of beliefs about how software should be supplied to users. William Hern explains.

For most computer users the word GNU means a set of good but memory-greedy development tools that are available on a wide range of machines. While this is all true (especially the bit about memory requirements) there is more to GNU than just that. GNU is not just software - it's a philosophy about the way that software should be distributed.

GNU (to prevent any confusion, the 'G' is pronounced, as in Flanders and Swann) is the creation of one Richard M. Stallman, inventor of the famous EMACS editor and formerly of the Artificial Intelligence Lab at MIT. Founder of the Free Software Federation (FSF), Stallman's ultimate ambition for GNU is that it should form a complete Unix compatible system and which can be given away free to anyone who wants it.

That final point is the key to the whole GNU crusade. Stallman has no time for software companies who place copyright restrictions on users, preventing them from sharing the software with others. If someone would gain from using a software package, why shouldn't they use it? According to Stallman, software licences are actually destructive as placing restrictions on who may or may not use a program reduces the amount of wealth that humanity derives from the program. Allowing everyone free access to the same good system software reduces wasteful duplication of effort, argues Stallman, and channels this effort instead into advancing the state of the art.

Underpinning the GNU philosophy is Copyleft, the FSF's answer to copyright. A program released under the terms of Copyleft cannot have its circulation restricted by anyone. The source code must also be provided so that users can learn from it or alter it to suit their needs. Copylefted programs are even freer than uncopyrighted public domain software, as a piece of public domain software could subsequently be copyrighted and have its use restricted, even against the author's wishes.

A common misconception is that GNU software is without cost. In fact, Copyleft says nothing about the price charged to users for receiving software. It is perfectly legal for a company or individual to charge another for supplying a GNU application, as long as it does not try to prevent them obtaining it from another source. The FSF itself is an example - to get the GNU software from them on magnetic tape or CD-ROM costs a thousand or six hundred dollars respectively, both prices well over the cost of the media used. However it is available from plenty of cheaper sources as well, such as electronic bulletin boards and public domain libraries.

Although the dream of a full system is far from complete, there is still an impressive lineup of GNU software available today - and much of it has been ported to the ST. First of all there are the compilers for C, C++ and Smalltalk. These are good quality products, especially the C compiler which is capable of some astute code optimisations to improve performance. Both the C++ and Smalltalk compilers (although the latter only just runs on STs owing to memory restrictions) are worth a look by ST owners as they are the only compilers for those languages available on the ST.

The compilers form only part of the GNU software development environment. GNU EMACS is one of the most powerful text editors in the world and is ideally suited to writing code. GNU Debug (usually referred to as GDB) is a capable debugger and GNU Make can automate the time consuming edit, compile, link development cycle. There is also Bison which is a tool for automating the process of creating compilers.

My favourite piece of GNU software, though, has to be GNU Plot. This is a quite amazing product capable of plotting even the most complex graphs and is a match for any commercial offering. I've seen it used for a multitude of tasks, ranging from simple line graphs to multi-surface three dimensional images. Unfortunately, it is not particularly easy to use and it can be very slow to produce plots, but for sheer power it has no equal.

A common complaint about GNU software that I hear from ST users is "It may be powerful but why, oh why, does it demand so much memory?" It's a valid point - many GNU packages require a four megabyte ST - but there is little that can be done about it. The base configuration that GNU programmers are told to write for is a thirty-two bit processor equipped with virtual memory, enabling them to forget about memory limits. Knowing this minimum specification, it's amazing that so much GNU software has made it to the ST.

GNU software is available on almost all Unix systems and many personal computers. One notable exception is the Apple Macintosh which is officially boycotted by the FSF. Apple's recourse to law to protect its innovative user interface and system software is a total violation of the GNU aims and so you won't see any GNU software appear on Apple machines for the foreseeable future.

The FSF is not without critics. It is accused of destroying many programmers' creativity by 'dumping' large amounts of software on the world. Many have scorned the chances of selling business applications such as word processors or spreadsheets in this manner. Copyleft has been called a perversion of the legal system and no less constraining than software licences from many mainstream software companies. Doubters claim that the FSF is trying to destroy the links existing between software and the programmer who wrote it. Pro- and anti-GNU-ists are locked in a seemingly never-ending series of arguments, both camps displaying a quasi-religious fanaticism in support of their cause.

Stallman's beliefs about the distribution of software may be controversial but there can be no denying the quality of the existing GNU software. My advice is to go and get some of the GNU applications and make whatever use you want of them. But also read through the Copyleft and GNU Manifesto files that should come with the programs and make up your own mind whether this is the way that software should be published.

Programmers' Forum

In this month's edition of ST Applications' regular programming column, we play with the colour resolutions of the ST, and discover how to display multiple low resolution pictures at the same time.

Switching resolutions

Kicking off this month's column, a letter from Geoff Smith of Nottingham:

I am currently writing a C program for the ST which operates in low resolution. Unfortunately, my C compiler (Prospero C) only works in medium or high resolution and it is very tedious to have to quit the programming environment, change the resolution, reopen windows to find the program, test it and then do it all again to get back into the editor.

Therefore, what I would like to be able to do is to get the program to automatically switch from medium resolution to low resolution. From observation of other programs it would seem to be possible: for example the Tinystuff file format converter will happily display low resolution pictures even if you run it from medium resolution. However, if I use the call

```
xbios(5,logical_screen,physical
_screen,resolution)
```

which is documented as switching resolution, all I get is a corrupted screen and I am forced to reboot. I would be grateful if you could tell me how it is done.

Geoff has hit one of the perennial 'gotchas' in ST programming: the inability of TOS and GEM to handle a resolution change without a virtual restart. The bottom line on resolution changes is that you can change the resolution as much as you like, as long as you can live without any of the high level operating system graphic support. This means no mouse, no AES, and no VDI. The problem is that Atari have provided no legal way of persuading the graphics code to reinitialise itself for a new screen resolution. The only approved method is to get the user to run the program in an appropriate resolution.

Programs whose only aim in life is to display a picture on the screen can quite happily set the resolution as they require - for example the low resolution picture tiling program from Listings 2 and 3 (see below) works when run from either low or medium resolution. It is possible to be rather more adventurous than this, as Listing 1 suggests.

The listing gives C source code for a simple program which demonstrates that the BIOS text code handles resolution changes correctly. The program assumes that it will be run from medium resolution. Upon loading, it allows the user to type characters, displaying them on the screen. Characters will be displayed from the medium resolution font. When the Escape key is pressed, the XBIOS function Setscreen() is used to change to low resolution. User input is now echoed to the screen using the low resolution screen font, until Escape is pressed once again to terminate the program, when medium resolution is reinstated.

The program uses the Line A calls lineaa() and linea9() to hide and redisplay the mouse. For newcomers to ST programming, a word of explanation is probably in order. The Line A system provides the fundamental graphics routines or 'primitives' used by GEM to display its dialogue boxes and icons. It is awkward to use, and in recent years Atari have discouraged programmers from relying on it, as future machines may not support it in its current form. However, for simple demonstration programs, it remains a useful way of obtaining limited graphics support without initialising a VDI virtual workstation.

If these Line A calls are commented out, and the program recompiled, the mouse pointer remains on the screen while the program runs. By moving the mouse, you should find that, although the mouse shape is correctly rendered in low resolution, the mouse system has not taken account of the change in screen width from 640 pixels to 320 pixels. The mouse pointer can be made to disappear off one side of the screen, and wrap around to the other!

Returning to Geoff's particular situation, if the program that he is developing uses only a mixture of text I/O and direct writes to the screen, then simple Setscreen() calls should suffice to change the resolution while the program runs. If, as I suspect from his letter, the program requires GEM, I'm afraid he is stuck with having to change resolution manually.

Picture tiling

Moving from one colour programming problem to another, an old friend of Programmers' Forum, **John Durst**, writes from Italy with a challenging question:

I have often struggled to find a stable way of changing palettes on the fly. The information I have been able to get at is very sparse, and though I have experimented, I never seem to get the interrupts right; usually a total freeze-up and everything has to be rebooted. And yet, done properly, it's beautifully stable.

I have a little program which puts up 4 quarter-size Neochrome pictures, which would benefit if one could display appropriate palettes for upper and lower screen. Quarter-screen, I'm afraid, would be beyond software.

Regular readers of ST Applications may remember an article by Jonathan Howell published last year (STA 21, page 34) which discussed on-the-fly palette changing. In the example program that accompanied that piece, he showed how to use the technique to obtain more than 16 colours on the low resolution screen simultaneously.

Since Jonathan explained the niceties of the technique in that article, we will not cover it in exhaustive detail here. The basic principle is that the program harnesses a periodic interrupt known as the 'horizontal blank timer'. This interrupt occurs after the electron guns of the monitor have finished writing a line of the screen display. During the short interval between the end of one line and the beginning of the next, the program changes the values in the colour palette registers, and the next line appears with different colours.

Listings 2 and 3 show how the palette-switching technique can be applied to John's programming task. This program is capable of taking in two or four DEGAS .PI1 or Neochrome low resolution pictures, reducing each of them to one-quarter size, and then tiling them on to a single low resolution screen. This is then displayed using paletteswitching.

To obtain a working program, Listing 2 should be compiled, Listing 3 assembled, and the resulting object files linked together. A suitable linker control file appears as Listing 4. The program is written using the Lattice C development system - see below for details on how to port it to other compiler packages.

Listing 2 contains the basic user interface and file handling code for the program. The array 'file_list' contains a list of four low resolution pictures to be used as input data. The main() function processes each picture in turn: if only two pictures are to be loaded, the second and fourth files are ignored. Each picture contains both bit image and palette data - these must be disentangled from each other. This operation is performed by the picture loading functions load_neochrome() and load_degas(). These use the load_file() function to read the file from the disk, and then process the data according to the picture format. The results are returned in the form of a descriptor block which contains pointers to the image and palette data blocks.

These are processed into a quarter-sized image by the shrink_picture() function from Listing 3. This may sound involved, but it is actually straightforward. To squeeze a picture in this way, we simply drop every other pixel along a scan line, and omit alternate scan lines. The interleaved plane structure of the ST low resolution screen makes the task a little fiddly, but we end up with a picture 110 pixels across and 100 lines high. The palette data is processed by build_pal_table() to create a table containing 100 copies of the palette (one for each line) with a gap between each copy to allow a second palette to be interleaved.

By calling these functions for each picture and writing the processed data to a different place each time (this is the function of the two lines in Listing 1 preceding the shrink_picture() call), we end up with a screen-size block of memory that contains the bit image data for the pictures, each occupying a quadrant of the screen, and a palette table that contains two blocks of 16 words for each scan line.

The display of this composite image is handled using the assembly language function display_pictures() [Listing 3]. This function enters supervisor mode and saves the state of various important system registers, before showing the picture. Before returning to the C package, the system registers are reinstated using the 'restore' subroutine. The 'display' subroutine calls Setscreen() to display the picture, and then installs the various interrupt vectors to engage the palette shifting code. After switching the video hardware to low resolution, it simply waits for the space bar to be pressed before returning.

The palette-shifting code in the 'H_blank' and 'V_blank' interrupt handlers is based on work by Jonathan Millar published a long time ago in ST World (May 1988, p104). The V_blank routine is called before the first scan line is drawn. It sets up the palette registers for the first line, and initialises the MFP timer B system to interrupt on every horizontal blank.

Thereafter, at the end of each scan line, the H_blank handler is called. This loads the next 16 word palette into the video shifter's registers. There is almost sufficient time to complete this task before the next scan line is begun. However, a little instability can sometimes be seen on the left border of the screen. If the program is only displaying two pictures on the screen, the work of H_blank routine is finished now, and it terminates.

However, if the program is attempting to display four pictures on the same screen, the palette must be changed over halfway through the scan line. The 'nop' instructions cause a delay until the middle of the screen is reached. Obviously, we cannot reload the palette registers instantaneously: there are 16 words to be moved from one memory location to another. Therefore, for a while, the palette will contain some values appropriate to the first half of the scan line, and some to the other half. In fact, the situation is worse than this: we simply do not have enough time to finish changing over the palette before the line ends. Only about 8 of the 16 colours can be reset.

To see what happens if one attempts to change over more colours, try reinstating one of the commented-out move.l (a1)+,(a0)+ opcodes. If you do this, note that the lea instruction will need altering to compensate for the extra move. Owners of STs with accelerator cards will need to insert extra nop instructions to get the palette switch to occur at the correct point on the screen. With extra processor speed, it should be possible to change over more colours in the second half of the scan line.

John's original supposition that two complete palettes per line would be beyond software seems correct. However, if the two pictures displayed on each line share common colours, it might be possible to achieve the desired effect. I should end by admitting that this sort of screen hackery is not really my forte. If some wizard demo programmer has any tips on this or similar subjects, their advice would be most welcome.

Portability

This month's listings are designed for use with the Lattice C development system. However, they do not rely on any odd library functions particular to this package, and therefore should port onto other compiler/assembler systems without major problems.

One area which is likely to require some attention is the linkage between the C and assembly language functions in Listings 2 and 3. Check your compiler documentation for the rules governing how C code should interface with functions written in assembly language (argument passing, register usage, etc.). Another possible cause of problems is a difference in the size of an int: the functions are written on the basis that an int is a 32 bit quantity, and a short is 16 bits.

The tiling program in Listings 2 and 3 is designed to work with a standard 320 by 200 ST low resolution screen. No guarantees are given as to its operation on more exotic screen displays!

NEXT MONTH

Next month, Programmers' Forum will print more questions and tips from readers' letters. Keep the letters coming in - the more we receive, the better the column gets! Hints on any subjects or questions about programming problems should be sent to the address below. All contributions, no matter how simple or advanced, are most welcome. Please include your address on the letter, so that I can get back to you if anything in your contribution is unclear. E-mail addresses are useful too.

Please send a disk (or email) if there are large chunks of text or ASCII source code: I have no time to retype lots of material. Naturally, disks will be returned if an SAE is included.

Jon Ellis
Programmers' Forum
29 Ashridge Drive
Bricket Wood
St Albans
Hertfordshire
AL2 3SR
Email: jonellis@uk.co.compulink.cix

```
Listing 1
=========


/*
** Listing 1.
** Programmers' Forum STA 27 (March 1993)
**
** Quick program demonstrating how the BIOS
** text system is reinitialised when the colour
** resolution is changed. The mouse is not
** reinitialised and so is not usable: see what
** happens when the lineaa() and linea9() function
** calls are commented out.  Designed to be run from
** low resolution.
**
** Compiler system: Lattice C v5.52
** Compile options: -cargfku
**  Meaning: Enable ANSI mode, disable trigraphs, enable
**           non-ANSI keywords, assume unsigned chars
** Link with C.O and LC.LIB
** Written on 2nd January 1993
*/
#include <dos.h>
#include <linea.h>
#include <osbind.h>

/*
** Define useful symbols for the XBIOS
** Setscreen call.
*/

#define NO_CHANGE   ((void *)(-1L))
#define LOW         0
#define MEDIUM      1

/*
** Declare the functions...
*/

int main(int,char **,char **);
void wait_escape(void);

/*
** The program starts here...
*/
```

```
int main(argc,argv,envp)

int argc;
char **argv, **envp;

{
    linea0();           /* Initialise the Line A library code */
    lineaa();           /* Hide the mouse pointer             */

    wait_escape();
    Setscreen(NO_CHANGE,NO_CHANGE,LOW);
    wait_escape();
    Setscreen(NO_CHANGE,NO_CHANGE,MEDIUM);

    linea9();           /* Show the mouse pointer             */
    return(0);
}


/*
** Function to wait for the user to press the Escape
** key.  It uses the console I/O system for performance.
** However, this means that we have to catch non-ASCII
** keys (eg function keys) ourselves.  CR is also processed
** into CR + LF to give the expected behaviour.  The function
** returns when Escape is pressed.
**
** Usage:   void wait_escape(void);
*/

void wait_escape(void)

{
    int c;

    while ((c = cgetc()) != 0x1B)
        {
        if (c == 0x00)
            c = cgetc();
        else if (c == 0x0D)
            cputc(0x0A);
        }
}
Listing 2
=========

/*
** Listing 2.
** Programmers' Forum STA 27 (March 1993)
**
** Top level interface for program to tile two or four
** full screen DEGAS or NEOCHROME low resolution
** pictures onto the same screen, showing palette
** switching techniques.
**
** Compiler system: Lattice C v5.52
** Compile options: -cargfku
**  Meaning: Enable ANSI mode, disable trigraphs, enable
**           non-ANSI keywords, assume unsigned chars
** Link with C.O, LISTING3.O and LC.LIB
** Written on 21st June 1992
*/

#include <dos.h>
#include <portab.h>
#include <stdio.h>

/*
** Symbols for array bounds etc
*/

#define COLUMNS             320
#define ROWS                200
#define PLANES              4
#define BITS_PER_BYTE       8

#define PALETTE_SIZE        32
#define IMAGE_SIZE          32000
#define DEGAS_SIZE          32034
#define NEOCHROME_SIZE      32128

#define INPUT_BUFFER_SIZE   NEOCHROME_SIZE
#define PALETTE_BUFFER_SIZE (ROWS * 2 * PALETTE_SIZE)
#define ROW_SIZE            ((COLUMNS * PLANES) / BITS_PER_BYTE)

#define NEOCHROME           1
#define DEGAS               2

#define LOW                 0
#define MEDIUM              1
#define HIGH                2


/*
** Type definitions.  You may need to alter
** word and byte for your compiler system.
*/

typedef unsigned char byte;
typedef unsigned short word;

typedef struct
    {
    short pc_resolution;        /* Resolution of picture, 0 = low etc   */
    word *pc_palette;           /* Pointer to 16 word palette table     */
    word *pc_image;             /* Pointer to picture image data        */
    } PICTURE;

typedef struct
    {
    char *in_name;              /* Full pathname of picture file        */
    int in_type;                /* Picture file format: DEGAS or NEO    */
    } INPUT_FILE;

/*
** Function declarations...
*/

extern void shrink_picture(word *,word *);
extern void build_pal_table(word *,word *);
extern void display_pictures(int,word *,word *);

int main(int,char **,char **);

int load_file(char *,word *,int);
int write_degas(char *,int,word *,word *);
PICTURE *load_neochrome(char *,word *);
PICTURE *load_degas(char *,word *);

/*
** Buffers for the pictures - make sure that
** the input buffer is big enough.
*/

word far *screen;

word far input_buffer[INPUT_BUFFER_SIZE/sizeof(word)];
word far screen_buffer[(IMAGE_SIZE+1024)/sizeof(word)];
word far palette_buffer[PALETTE_BUFFER_SIZE/sizeof(word)];


/*
** A list of pictures to process - alter to refer to
** your favourite 4 Degas or Neochrome files.
*/

INPUT_FILE file_list[4] =    {{"PICTURES\\BUGS.NEO",NEOCHROME},
                              {"PICTURES\\PARROTS.NEO",NEOCHROME},
                              {"PICTURES\\ESCHER.NEO",NEOCHROME},
                              {"PICTURES\\DIRE.NEO",NEOCHROME}};


/*
** The program starts here...
*/

int main(argc,argv,envp)

int argc;
char **argv, **envp;

{
    int f, error, image_offset, palette_offset, tile2;
    PICTURE *ptr;
    word *image, *palette;

    printf("\033E\nNeochrome/Degas picture tiler\n\n");
    while (TRUE)
        {
        printf("Tile 2 or 4 pictures ? ");
        tile2 = cgetc();
        if (tile2 == '2' || tile2 == '4')
            break;
        printf("\nPlease select either '2' or '4'\n");
        }
    putchar('\n');
    tile2 = (tile2 == '2') ? TRUE : FALSE;

    error = FALSE;
    screen = (word far *)((unsigned int)(screen_buffer+512) & 0xFFFFFE00);
    for (f=0; f<4; f++)
        {
        if (!(tile2 && (f & 0x01)))
            {
            printf("Processing picture %d.  ",f+1);
            if (file_list[f].in_type == DEGAS)
                ptr = load_degas(file_list[f].in_name,input_buffer);
            else if (file_list[f].in_type == NEOCHROME)
                ptr = load_neochrome(file_list[f].in_name,input_buffer);
            else
                {
                printf("Unsupported picture format\n");
                error = TRUE;
                break;
                }
            if (ptr == NULL)
                {
                error = TRUE;
                break;
                }
            if (ptr->pc_resolution != LOW)
                {
                printf("Not a low resolution picture\n");
                error = TRUE;
                break;
                }
            image = ptr->pc_image;
            palette = ptr->pc_palette;
            putchar('\n');
            }
        else image = palette = NULL;

        image_offset = (f / 2) * (IMAGE_SIZE/2) + (f % 2) * (ROW_SIZE/2);
        palette_offset = (f / 2) * (PALETTE_BUFFER_SIZE/2) + (f % 2) * PALETTE_SIZE;
        shrink_picture(image,screen+(image_offset / sizeof(word)));
        build_pal_table(palette,palette_buffer+(palette_offset / sizeof(word)));
        }

    if (error == TRUE)
        {
        printf("\n\nPress <RETURN> to continue: ");
        getchar();
        return(0);
        }

    printf("Ready to display picture.  Press <RETURN> to see picture.\n");
    printf("Press space-bar to end picture display\n");
    getchar();
    display_pictures(tile2,screen,palette_buffer);

/*    write_degas("TILED.PI1",LOW,palette_buffer,screen);*/

    return(0);
}


/*
** Function to read in and process a Neochrome
** low resolution file.  The arguments are a pointer
** to the pathname of the file and a pointer to an
** adequately sized buffer to hold the data.  The
** return is a pointer to a PICTURE structure or
** NULL if there was any error.
**
** Usage:   spec = load_neochrome(name,buffer);
**
**          PICTURE *load_neochrome(char *,word *);
*/

PICTURE *load_neochrome(name,buffer)

char *name;
word *buffer;

{
    static PICTURE spec;

    if (load_file(name,buffer,NEOCHROME_SIZE) == FALSE)
        return(NULL);
    spec.pc_resolution = *(buffer+1) & 0x03;
    spec.pc_palette = buffer+2;
    spec.pc_image = buffer+64;
    return (&spec);
}


/*
** Function to read in and process a DEGAS picture
** file.  Only the simple .PI? format is supported.
** The arguments are a pointer to the pathname of
** the file and a pointer to an adequately sized
** buffer to hold the data.  The return is a pointer
** to a PICTURE structure or NULL if there was any error.
**
** Usage:   spec = load_degas(name,buffer);
**
**          PICTURE *load_degas(char *,word *);
*/

PICTURE *load_degas(name,buffer)

char *name;
word *buffer;

{
    static PICTURE spec;

    if (load_file(name,buffer,DEGAS_SIZE) == FALSE)
        return(NULL);
    spec.pc_resolution = *buffer & 0x03;
    spec.pc_palette = buffer+2;
    spec.pc_image = buffer+34;
    return (&spec);
}


/*
** Function to load a block of bytes into a buffer.
** The arguments are a pointer to the pathname, a
** pointer to the buffer and the size of the block.
** The block is read without any translation.  No
** checks are made that the buffer is big enough.
** The return value is TRUE if all went OK, or
** FALSE if not in which case an error message will
** have been written to stdout.
**
** Usage:   result = load_file(name,buffer,size);
**
**          int result, load_file(char *,word *,int);
*/

int load_file(name,buffer,size)

char *name;
word *buffer;
int size;

{
    FILE *fp;

    if ((fp = fopen(name,"rb")) == NULL)
        {
        printf("File error: cannot open input file.\n");
        return(FALSE);
        }
    if (fread(buffer,size,1,fp) != 1)
        {
        printf("File error: cannot read input file.\n");
        fclose(fp);
        return(FALSE);
        }
    fclose(fp);
    return(TRUE);
}


/*
** Function to make up a Degas file from the four
** picture composite data.  The arguments are a
** pointer to a filename to use, the resolution
** word value, and pointers to palette and image
** data.  The function returns TRUE if all went
** well, or FALSE if not, when an appropriate
** error message is written to stdout.
**
** Usage:   result = write_degas(name,res,pal,data);
**
**          int result, write_degas(char *,int,word *,word *);
*/

int write_degas(name,res,pal,data)

char *name;
int res;
word *pal, *data;

{
    FILE *fp;
    word resolution;
    int error;

    printf("Writing test output file: %s\n",name);
    resolution = (word)res;
    error = FALSE;
    if ((fp = fopen(name,"wb")) == NULL)
        {
        printf("File error: cannot open output file.\n");
        return(FALSE);
        }
    if (fwrite(&resolution,sizeof(word),1,fp) != 1)
        {
        printf("File error: cannot write resolution word.\n");
        error = TRUE;
        }
    if (error == FALSE && fwrite(pal,PALETTE_SIZE,1,fp) != 1)
        {
        printf("File error: cannot write palette data.\n");
        error = TRUE;
        }
    if (error == FALSE && fwrite(data,IMAGE_SIZE,1,fp) != 1)
        {
        printf("File error: cannot write bit image data.\n");
        error = TRUE;
        }
    fclose(fp);

    if (error == TRUE)
        {
        remove(name);
        return(FALSE);
        }
    return(TRUE);
}
Listing 3
=========

**
** Listing 3.
** Programmers' Forum STA 27 (March 1993)
**
** Module containing assembly language functions
** for Neochrome/Degas low resolution tiling program.
** There are three functions designed to be called
** from C according to the Lattice C v5.5 interface
** using default long integer mode (ie do NOT link
** this with modules compiled under -w).  The
** display_pictures() function is based on techniques
** developed by Jonathan Millar (ST World, May 1988, p104)
**
** Assembler system: Lattice asm v5.52
** Assemble options:
** Written on 21st June 1992
```

```
**

**
** Define symbols used by the module.
**

GEMDOS              equ     1
Crawcin             equ     $07
Super               equ     $20

XBIOS               equ     14
Physbase            equ     2
Setscreen           equ     5
Setpalette          equ     6
Vsync               equ     37

VBLint_vec          equ     $0070
MFP_KbdMidi_vec     equ     $0118
MFP_TimerB_vec      equ     $0120


vdr_colour_0        equ     $FFFF8240
vdr_resolution      equ     $FFFF8260
mfp_parallel_port   equ     $FFFFFA01
mfp_int_enable_A    equ     $FFFFFA07
mfp_int_enable_B    equ     $FFFFFA09
mfp_int_service_A   equ     $FFFFFA0F
mfp_int_mask_A      equ     $FFFFFA13
mfp_timerB_control  equ     $FFFFFA1B
mfp_timerB_data     equ     $FFFFFA21
acia_key_data       equ     $FFFFFC02


          TEXT

**
** Function to convert a low resolution picture into
** an image one quarter the size.  This is done by
** omitting every other pixel on a line, and every
** other line in the image.  The output image is written
** to the top left-hand corner of the output buffer, and
** the space around ignored, allowing pictures to be
** tiled.  The arguments are pointers to the 32000 byte
** data block of a screen and to the output area.  If the
** input block pointer is NULL, the output buffer is
** cleared.
**
** Usage: shrink_picture(data,output);
**
**        void shrink_picture(word *,word *);
**

          XDEF      _shrink_picture
          XDEF      _build_pal_table
          XDEF      _display_pictures

_shrink_picture:

          movem.l   d2-d7,-(sp)         Save register variables.
          move.l    28(sp),a0           Fetch pointer to screen buffer.
          move.l    32(sp),a1           Write to the output area.
          tst.l     28(sp)              Is the input pointer NULL ?
          beq.s     do_clear            Just clear it if so.
          moveq     #99,d7              100 lines in output image.
1$        moveq     #9,d6               10 blocks of 32 pixels on each line.
2$        moveq     #3,d5               4 longs per 32 pixel block.
          clr.w     d2                  Need an offset into block.
3$        clr.w     d1                  Fach long compresses to a word.
          moveq     #15,d4              16 bits per output word.
          move.l    0(a0,d2.w),d0       Word 4/3/2/1 of 8 to upper word.
          move.w    8(a0,d2.w),d0       Word 8/7/6/5 of 8 to lower word.
4$        lsl.l     #1,d0               Copy first pixel bit to X
          roxl.w    #1,d1               Rotate into output accumulator.
          lsl.l     #1,d0               Waste the next pixel bit.
          dbra      d4,4$               Accumulate a full output word.
          move.w    d1,0(a1,d2.w)       Write it into the buffer.
          add.w     #2,d2               Bump on to next output word.
          dbra      d5,3$               Loop for rest of 32 pixel block.
          lea       16(a0),a0           Move to start of next block.
          addq.l    #8,a1               Next output area.
          dbra      d6,2$               Loop for rest of input line.
          lea       160(a0),a0          Skip an input line.
          lea       80(a1),a1           Skip half an output line.
          dbra      d7,1$               Loop for all input lines.
          movem.l   (sp)+,d2-d7         Recover C registers.
          rts

do_clear  moveq     #99,d7              100 lines in output block.
1$        moveq     #19,d6              20 long words per lines.
2$        clr.l     (a1)+               Clear the output area.
          dbra      d6,2$               Loop for whole of line.
          lea       80(a1),a1           Skip half an output line.
          dbra      d7,1$               Loop for all output lines.
          movem.l   (sp)+,d2-d7         Recover C and return.
          rts


**
** Function to copy a sixteen word palette
** specification 100 times into a block of
** memory allowing space for another palette
** to be interleaved with it.  The arguments
** are pointers to the data and to the output
** area.  There are no returns.  If the data
** input pointer is NULL, no action is taken.
**
** Usage: build_pal_table(data,area);
**
**        void build_pal_table(word *,word *);
*/

_build_pal_table:

          move.l    8(sp),a1            Fetch pointer to output area.
          tst.l     4(sp)               Is the input area valid ?
          beq.s     2$                  No, so skip the copy.
          moveq     #99,d0              Copy 100 times.
1$        move.l    4(sp),a0            Get pointer to input palette.
          move.l    (a0)+,(a1)+         Copy 16 words = 8 longs.
          move.l    (a0)+,(a1)+
          move.l    (a0)+,(a1)+
          move.l    (a0)+,(a1)+
          move.l    (a0)+,(a1)+
          move.l    (a0)+,(a1)+
          move.l    (a0)+,(a1)+
          move.l    (a0)+,(a1)+
          lea       32(a1),a1           Skip to allow interleave.
          dbra      d0,1$
2$        rts


**
** Function to display the tiled picture on the
** screen using palette switching to display each
** with the right colours.  This may occupy almost
** all of the ST processing time !  The arguments are:
** a mode flag which determines whether one (TRUE)
** or two (FALSE) palettes should be used on the same
** scanline; and pointers to the bit image and the
** palette tables.  The function returns when the
** space bar is pressed.
**
** Usage: display_pictures(mode,data,palettes);
**
**        void display_pictures(int,word *,word *);
**

_display_pictures:

          movem.l   d2-d7/a0-a6,-(sp)   Save C registers.
          lea       variables,a6        Point to our variable area.
          move.w    58(sp),mode         Copy mode flag,
          move.l    60(sp),screen(a6)   and pointers to the screen
          move.l    64(sp),palette(a6)  the palette areas.
          clr.l     -(sp)               Go into supervisor mode for the
          move.w    #Super,-(sp)        duration of this function.
          trap      #GEMDOS
          addq.l    #6,sp
          move.l    d0,old_SSP(a6)      Save old SSP for restoration later.
          bsr.s     save                Save important register values.
          bsr       display             Put the picture on the screen.
          bsr.s     restore             Restore everything and return.
          move.l    old_SSP(a6),-(sp)
          move.w    #Super,-(sp)
          trap      #GEMDOS
          addq.l    #6,sp
          movem.l   (sp)+,d2-d7/a0-a6   Recover C registers and return.
          rts


**
** Subroutine to save system variables and
** hardware register settings so the system
** can be restored after the display is over.
**    Inputs:       ** SUPERVISOR MODE **
**                  a6  -> variable save area
**    Outputs:      None
**    Destroys:     d0-d7/a0-a1
**

save      lea       vdr_colour_0.w,a0   Start by saving the current palette.
          lea       old_pal(a6),a1
          movem.l   (a0),d0-d7          Pick up 8 longs = 16 words.
          movem.l   d0-d7,(a1)          All done !
          lea       mfp_parallel_port.w,a0        Address MFP registers.
          move.b    6(a0),old_ierA(a6)  Save interrupt enable register A
          move.b    8(a0),old_ierB(a6)  Save interrupt enable register B
          move.b    18(a0),old_imrA(a6) Save interrupt mask register A
          move.b    vdr_resolution.w,old_res(a6)  Save resolution byte.
          move.w    #Physbase,-(sp)     Find the current screen address.
          trap      #XBIOS
          addq.l    #2,sp
          move.l    d0,old_scrn(a6)     Save it.
          move.l    MFP_KbdMidi_vec.w,old_key(a6) Save MFP key/MIDI vector
          move.l    MFP_TimerB_vec.w,old_TimB(a6) Save MFP Timer B vector
          move.l    VBLint_vec.w,old_VBL(a6)      Save 68000 IPL 4 vector
          rts


**
** Subroutine to restore the state of the
** system to how it was before we changed
** anything.
**    Inputs:       ** SUPERVISOR MODE **
**                  a6  -> variables area
**    Outputs:      None
**    Destroys:     d0-d7/a0-a1
**

restore   move.w    SR,-(sp)            Save current IPL.
          ori.w     #$0700,SR           Lock out all interrupts for this.
          lea       mfp_parallel_port.w,a0          Address MFP registers.
          move.b    old_ierA(a6),6(a0)  Restore interrupt enable register A
          move.b    old_ierB(a6),8(a0)  Restore interrupt enable register B
          move.b    old_imrA(a6),18(a0) Restore interrupt mask register A
          move.b    old_res(a6),vdr_resolution.w  Restore resolution byte.
          move.l    old_key(a6),MFP_KbdMidi_vec.w Restore keyboard/MIDI.
          move.l    old_TimB(a6),MFP_TimerB_vec.w Restore MFP Timer B vector
          move.l    old_VBL(a6),VBLint_vec.w      Restore 68000 IPL 4 vector
          move.w    (sp)+,SR            Recover IPL.
          move.w    #Vsync,-(sp)        Wait for vertical blank.
          trap      #XBIOS
          addq.l    #2,sp
          move.w    #$FFFF,-(sp)        Do not alter resolution.
          move.l    old_scrn(a6),-(sp)  Restore old physical screen.
          pea       -1                  Do not alter logical screen.
          move.w    #Setscreen,-(sp)    Change screen on next VBL.
          trap      #XBIOS
          lea       12(sp),sp
          pea       old_pal(a6)         Also restore palette on next VBL.
          move.w    #Setpalette,-(sp)
          trap      #XBIOS
          addq.l    #6,sp
          rts

**
** Subroutine to actually display the picture
**

display   move.w    #$FFFF,-(sp)        Do not alter resolution.
          move.l    screen(a6),-(sp)    Look at new screen
          pea       -1                  Do not alter logical screen.
          move.w    #Setscreen,-(sp)    Change screen on next VBL.
          trap      #XBIOS
          lea       12(sp),sp
          clr.b     mfp_int_enable_A.w  Turn off all MFP interrupts except
          and.b     #$40,mfp_int_enable_B.w       the keyboard system/
          bset.b    #0,mfp_int_mask_A.w Mask enable Timer B interrupt.
          lea       H_blank(pc),a0      Install the horizontal and vertical
          move.l    a0,MFP_TimerB_vec.w blank vector handlers.
          lea       V_blank(pc),a0
          move.l    a0,VBLint_vec.w
          lea       Key_Midi(pc),a0     Install keyboard hack handler.
          move.l    a0,MFP_KbdMidi_vec.w
          move.b    #0,vdr_resolution.w Switch to low resolution.

1$        move.w    #Crawcin,-(sp)      Wait for space bar to be pressed.
          trap      #GEMDOS
          addq.l    #2,sp
          cmp.b     #' ',d0
          bne.s     1$                  Loop until the key is space.
          rts

**
** Keyboard/MIDI handler.  This is called by an MFP
** interrupt whenever a byte is received from the
** keyboard/MIDI ACIA.  We simply drop the IPL to 5
** to allow other MFP interrupts, then allow the
** system routine to do its work.
**

Key_Midi  move.w    #$2500,SR           Drop IPL from 6 to 5.
          move.l    old_key+variables,-(sp)
          rts                           Indirect jump to old handler.

**
** Timer B handlers.  This is called by an MFP interrupt
** at the end of every screen line, during the horizontal
** blank.  Timing is crucial here, as there is only about
** 64 microseconds to do everything.  It is fairly easy to
** have a different palette for each line, but 2 per line
** seems impossible.
**

H_blank   movem.l   a0/a1,-(sp)         Save the registers that we use.
          bclr      #0,mfp_int_service_A.w        Unlock the MFP interrupts.
          move.l    cur_pal(pc),a1      Fetch pointer to palette to use.
          lea       vdr_colour_0.w,a0   Transfer it directly into hardware
          move.l    (a1)+,(a0)+         palette registers.  This needs to
          move.l    (a1)+,(a0)+         be done as fast as possible.
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          tst.w     mode                2 palette/line mode ?
          bne.s     1$                  Skip if so.
;
; Delay until electron guns have
; travelled about halfway across the
; screen.  Timed for 8 MHz ST - alter
; number if you have something faster...
;
          nop
          nop

          lea       vdr_colour_0.w,a0   Now attempt to load a second
          move.l    (a1)+,(a0)+         palette for the second half of the
          move.l    (a1)+,(a0)+         line.  It doesn't appear to be
          move.l    (a1)+,(a0)+         possible to transfer more than
          move.l    (a1)+,(a0)+         half of the palette before running
;          move.l    (a1)+,(a0)+        out of time.  These commented out
;          move.l    (a1)+,(a0)+        lines would transfer the rest of
;          move.l    (a1)+,(a0)+        the data.  Try uncommenting one
;          move.l    (a1)+,(a0)+        and adjusting the lea line.
          lea       16(a1),a1           Adjustment for untransferred data.
          bra.s     2$                  Jump over the next correction.
1$        lea       32(a1),a1           Skip the whole second palette.
2$        move.l    a1,cur_pal          Save current palette pointer.
          movem.l   (sp)+,a0/a1         Recover registers and return.
          rte

**
** Vertical blank handler.  This is called as an IPL 4
** 68000 interrupt at the end of every screen.  In contrast
** to the horizontal blank, we have lots of time here !
** The routine sets up the palette for the first screen line
** (remember the horizontal blank only gets called at the
** end of each line) and initialises the palette pointer
** and the timer B hardware.
**

V_blank   clr.l     -(sp)               Push dummy long onto stack.
          movem.l   a0-a1/a6,-(sp)      Save the registers we use.
          lea       variables,a6        Point to our variables area.
          move.l    palette(a6),a1      Fetch pointer to palette table.
          lea       64(a1),a1           Skip first line (2 palettes).
          move.l    a1,cur_pal          Set up for horizontal blank routine.
          lea       vdr_colour_0.w,a0   Copy first line palette into hardware.
          move.l    (a1)+,(a0)+         Note that we can only have 1 palette
          move.l    (a1)+,(a0)+         on first line using this method.
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          move.l    (a1)+,(a0)+
          lea       mfp_parallel_port.w,a0        Address MFP registers.
          bclr.b    #0,$06(a0)          Turn off Timer B interrupt.
          move.b    #0,$1A(a0)          Timer B control register: off.
          move.b    #1,$20(a0)          Interrupt every scan line.
          move.b    #8,$1A(a0)          Start Timer B counting now.
          bset.b    #0,$06(a0)          Open Timer B interrupt channel.
          move.l    old_VBL(a6),12(sp)  Put old handler address into dummy
          movem.l   (sp)+,a0-a1/a6      position on stack.  Recover registers,
          rts                           and jump to old routine now.

;======================================================================
**
** Data area for the program.  Most of the
** variables are in a block addressed by offset
** using an address register.
**

          OFFSET

screen    ds.l      1                   Pointer to program's screen
palette   ds.l      1                   Pointer to palette block
old_SSP   ds.l      1                   Space to save supervisor SP
old_pal   ds.w      16                  Space for current palette
old_ierA  ds.w      1                   Old interrupt enable register A
old_ierB  ds.w      1                   Old interrupt enable register B
old_imrA  ds.w      1                   Old interrupt mask register A
old_res   ds.w      1                   Old resolution byte
old_scrn  ds.l      1                   Address of system screen
old_key   ds.l      1                   Old MFP keyboard/MIDI ACIA vector
old_TimB  ds.l      1                   Old MFP Timer B vector
old_VBL   ds.l      1                   Old VBL (68000 IPL 4) vector
var_size  ds.b      0                   End marker for size of variable area.

          TEXT

          EVEN

variables ds.b      var_size            Reserve space for variables.
cur_pal   dc.l      0                   Pointer to current palette.
mode      dc.w      0                   Mode flag: 0->2 pals/line, 1->1

          END
```

```
Listing 4
=========

from
        C.O
        TILER.O
        SHRINK.O
library
        LC.LIB

to
        TILER.TOS
```

Classified Adverts

Classified adverts are free to subscribers.

Please use the form on page 58.

For Sale

Megapaint II mono drawing package – £45, Quick ST 3 – £10, Flair Paint – £10, manual for Harlekin 1 (As seen on cover disks) – £5, Wordflair 1 – £25. Call Frank on (0279) 434168 (Home) or (0438) 782551 (work). (28)

Mark Williams C Compiler £25, Hisoft C Interpreter £10, K Resource 2 £10, First Word Plus V3.14 £25, Timeworks Desktop Publisher £25, ST Basic Revised Edition £5, Borodino £6, Sub Logic Flight Simulator II with Scenery disks 7, 11 and 14 – £30, C Breeze (C Editor) £8, Fun School 2 Ages 6–8 – £10, Over 8 – £10. Phone (0344) 885609 (Ascot, Berkshire). (28)

Mega 1 ST, SM124 Monitor, Vortex HD Plus 40, Star NL 10 9–pin Printer, £560. All items unmarked and in perfect working condition, may split, must be bargain of the year. Microsoft Write – Word Writer – Swift Calc – VIP Professional – Super Base Personal £15 each, Degas Elite £10, SBA Cash £25. Tel: 0422–204199 anytime. (27)

SLM 804 Laser Printer for sale, in excellent condition and with plenty of drum life remaining, this can be yours for £280, includes the usual GDOS driver and fonts along with Diablo and Epson FX emulators, and I will throw in free your choice of Script or WordUp word processors along with extra font disk(s). You must arrange collection of this heavy printer, which must be transported with an empty toner hopper (new toner cartridge will be provided). Derryck 0923 673719 (Watford). (27)

Blackthorne Printer interface for Atari 800/XL/SE users, connects to any Parallel Centronics Printer Epson, Star, Cannon, etc., as new cost £79, quick sale £30+PP – also Basic XL cartridge with full manual, was £72, sell £25 + PP, this is a must for serious programmers. Ring Les 021–783–5807. (27)

UFO Disk Issue 2 now includes versions in Hypertext and Timeworks formats plus scanned Photographs. Send SAE + 3.5" disk to Steve Gunn, 16 Leverton Green, Clifton Estate, Nottingham NG11 8BS. (27)

Mega ST2, Blitter, Expansion Bus, etc, with Atari SM125 High Res Monitor, excellent condition – boxed + software – £450. Progate 100 DC Hard Disk, Series II ports, 2 year guarantee, excellent condition – boxed– £425. Bargain £750 the lot. Tel 081521 5271 (London E17). (27)

STE 4MB, SM144 Mono Monitor, Protar 20Mb Hard Drive c/w PageStream 2.1, 1st Word Plus. 3 months old. Still guaranteed. £550 ono. Contact Colin on 0685 874725. (27)

Cannon BJ10ex Bubblejet Printer, as new – £175. Software (Music) Kawai K4 Editor £25. Casio FZ Club Editor £25. Yamaha QY10 + Software £195. ST Calligrapher Lite £15. P Finance £10. Naksha Mouse £10 plus various bits. Call John on 0602 411185. (27)

Power Basic 1.31 £12. Habawriter III (multipotent W.P) £8. Mini Office Comms (shrink–wrapped) £8. 0273 502053 (Brighton). (27)

Atari bits: EVSI Synth £130, SC1224 Colour Monitor £130, Casio CZ1000 with stand £100, Gravis Mousestick £50, Cumana External Drive £40, and more. Call Steve on 081–53901701 for details. (27)

Amstrad SM2400 Modem, in carton with cables and manual, barely used, absolutely as new – with registered copy of FZDSTERM terminal software (the best on the ST): £85. Tim Cruise 0457 872221. (27)

Casio FZ sample disks: huge library of quality sounds. Also soundpatches for most major synths (M1, D110, SY77, K4, etc.); swaps or sale. Sample CD's wanted. Ring for details: Andy, 0532 430177. (28)

Atari SC1435 colour monitor £150. Phone Fred on 081 809 6852 evenings. (27)

Atari SC1224 colour monitor, vgc, £75 plus delivery or buyer collects. No offers. 0257 272119. (27)

ST original software: Daley Thompson, Rocket Ranger, K.O.2 – Winning Tactics, North and South, only £3 each. Hard Drivin'2, Killing Cloud, European Space Sim, Damocles only £5 each. Space 1889, F29 Retaliator, Flight of Intruder £8 each. Trimbase (relational database) £10. Phone John 0742 748794. (28)

Primax 2–way data switch box (Centronics), boxed as new, c/w two Centronic/Centronic cables and one Centronic/25–pin D male. Your "two peripheral problems" cured at a stroke! Only £45.00 Plus Golden Image hand scanner, boxed, manual etc. as new: £70.00 (£80.00 c/w Touch Up software). Plus Fleet Street Publisher v3.00, boxed, manual etc. £75.00. Or the whole lot for £170.00! Ring Bryan on 0298 78071 any time between 2pm and 10pm. (27)

Serious STE – 4MB RAM; Ladbroke's Data Pulse hard disk drive (11ms access time, no bad sectors). Atari SM124 high–res monitor. Golden Image hand scanner with Touch–Up software. Forget–Me–Clock II. PageStream v2.1. Calligrapher Pro (Gold). NeoDesk 3. Fontkit Plus 3. Digita DG Base. Mini Office Spreadsheet and comms software. All boxed with manuals: £800. Call Dave 0705 698975 (Portsmouth). (27)

1040 STFM, d/s drive, TOS 1.2, blitter chip, Blitz cable and all "Summer Promotion" games (app. 22) + any PD utilities you want: £200. Call Christian on 0395 68227.

1040 STFM, d/s drive, TOS 1.2, blitter chip, Blitz cable and all "Summer Pro–

Authorware

If you would like to see your software featured in the ST Applications Authorware column please send us a review copy of the software and a rough outline of the advertising copy you would like to be printed.

Morse Master

The complete morse trainer and simulator, with realistic 'on–air' emulator and integral editor, with complete control of your listening equipment. In addition to sending, your Atari can also receive and decode morse from your own key using the supplied interface cable. Usable by novices and professional radio operators alike. Send Cheque/PO for £29.99 payable to Boscad Ltd at: 16 Aytoun Grove, Balbridgeburn, Dunfermline, Fife, KY12 9TA. Telephone (0383) 729584 evenings for technical information.RAE Morse Test

Selectable letter/number groups, thinking time, note pitch, morse generation from keyboard for CQ; plus save to disk, etc. Instruction manual and disk for £7 or SAE for more details. R L Tuft, 62 Admirals Court, Thirsk, North Yorks. YO7 1RR. Telephone: 0845–525082

Pulser

A low–resolution programme which cycles the colours as you draw ... and keeps them moving. Create stunning graphics with movements. Every circle, line, square, ray etc can PULSE in any direction, all on the screen at the same time. £7.50 inclusive or £2.50 (refundable on upgrade) Demo 1 double sided or 2 single sided disks (state which). David J Fright, 113 Waytemore Road, Bishops Stortford, Herts.

STEN

ST ENthusiasts disk magazine – for your copy send a disk + SAE to: Dave Mooney, 14 School Road, Morningside, Newmains, Lanarkshire.

SynTax

The ST adventure magazine on disk! Reviews, solutions, hints, special features and much, much more. Runs in colour only. Produced bi–monthly. **SynTax** costs £3.50 an issue, £20 for a year's subscription. Cheques made payable to S. Medley should be sent to: 9 Warwick Road, Sidcup, DA14 6LJ.

Kitchen Design Program

Create kitchen plans, and elevation views to scale from a wide selection of units and appliances with worktops, pelmets, etc. High resolution mono only. Lawrence Elliott, 42 Gwaun Coed, Brackla, Bridgend, Mid Glamorgan CF31 2HS.

Clip Art

Clip Art specifically for Christian and Community Magazines. Seven disks of IMG images for DTP programs supplied with a printed picture catalogue of every image. Cost: £3 per disk plus P&P: total of £23 for the set. Cheques payable to: Peter Kempley, KemCom Designs, 21 Chart House Road, Ash Vale, Aldershot, GU12 5LS.

Calamus Manual

This self–tutorial guide incorporating sections on frame drawing, entering text, changing fonts and styles, importing text and images, drawing boxes and lines, loading, saving, printing, text rulers, headers and footers and page numbers. Available at £5 (including postage) from: David Waller, The Sandon School, Molram's lane, Great Baddow, Chelmsford, Essex, CM2 7AQ. Cheques should be made out to 'Sandon School'.

Genealogy

Newgen, my genealogy program, runs on any ST(E) or TT and is easy to use; it will print family trees, etc. Send large SAE for details or £17 for program. E G Richards, 2 Peckarmans Wood, London SE26 6RX.

Educational Adventures

For ages 5–13. 88% in ST Format. £12 each. 50p per disk for demo's. CVS, 18 Nelson Close, Teignmouth, TQ13 9NH. Tel: (0626) 779695.

RAE Morse Test

Selectable letter/number groups, thinking time, note pitch, morse generation from keyboardfor CQ; plus save to disk, etc. Instruction manual and disk and SAE for more details. R. L. Tuft, 62 Admirals Court, Thirsk, North Yorks, YO7 1RR. Telephone: 0845–525082.

Sonix Sound Sampling

We will sample your sounds from tape to disk. Ideal for demos, games and your own programs. 3–day turnaround guaranteed. Write for free details to: The Lodge, Delly End, Hailey, Witney, Oxon, OX8 5XD.

motion" games (app. 22) + any PD utilities you want: £200. Call Christian on 0395 68227.

Sub-Logic Flight Simulator 2 £12. Telephone Ken on Romford (0708) 723956. (27)

Calamus 1.09N – £70, DR. T's Sample Maker Version 1.5 – £70, Atari ST Machine Code Book – £10, Multigem Multitasking Software (Works well) – £50, Aladin Macintosh Emulator – No reasonable offer refused – Tel Nial on (0269) 845826. (27)

Atari STFM 520 plus Mouse Master £155, Philips CM8833 Colour Monitor £140, Atari SM124 Mono Monitor £70, 2nd Floppy drive £30, Daatascan Professional 400dpi Hand Scanner £60, Atari ST 3D Graphics and Atari ST M/C Language £8 each, User Guide to Timeworks DTP £5, all in original packaging. Must sell the lot as government grant run out (yep, me student) and my bank manager is out for my blood! Somebody buy it please. Phone Mark on 0582 468664, near St Albans.

Software – Megapaint £45, Cyber Sculpt + Studio + Control £65, Timeworks DTP v1.12 + Fontkit 3 + Fonts £35, Games – Dungeon Master, Chaos Strikes Back, Lemmings, Cadaver, Elite, Gods, Monkey Island, Elvira, Dega Vu 11, Supremacy, Stellar Crusade, Populous, Imperium, B A T, RVF Honda, Zenon 2; Fish – £5 each or £100 all games. All originals. Phone Mark on 0582 468664.

Atari 1040 STF, 720K Internal Drive, 720K External Drive, SM125 Mono Monitor, PC Speed PC Emulator, lots (50Mb +) of PD Software – £320. Degas Elite £5, Easytext + (9 Pin Printer) £5, Leisure Suit Larry £5, Balance of Power £5, Mark Williams C £25, C Debugger £5, Abacus and other Programming Books £5 each: Scotland 0786 825406. (28)

That's Write V1.5 £35, Easy Draw V2 £20: Phone Ken (0708) 723956. (29)

Atari 520 ST With 1/2Meg External Drive £55. (not boxed) Various Software including: (Timeworks) Swiftcalc, (Ataris) Hyperdraw, Hyperpaint, (Futuresoft) Jackpot 2, (Kumas) K Graph 3: Phone with offers if interested 031 334 1114. (29)

Atari ST Games: Knightmare £9.00, Azure Bonds £5.00, Tower or Babel £5,00. Many other games available, prices from £1.00: Fred, Darlington 0772 51737. (28)

Mega 1 ST £199, Vortex 40 Mg Hard Disc with Cache £199, Atari SM 124 Monitor £59, Star NL10 Printer £29. All items un-marked and in Perfect Condition. Word Processors/Spreadsheets/Data Base £12 each. Equinox Small Business Accounts £25, GFA Basic Interpreter V2 inc Glentop GFA Basic £10: Tel. 0422-204199 anytime. (28)

Lattice C V5 – Offers? Hisoft C Interpreter, Knife ST, Axelen Mouse, Books – ST Internals, Gem Prog. Reference, Peel, Basic-to-C. Offers invited! – Jeff (0992) 574973. (28)

Orla DMK7 Professional Master Keyboard 3 Split Points, 2 Midi Outs Store up to 128 Presets – 5 months old, boxed as new with manual £220, Yamaha PSS-780 5 Octave Keyboard Mid-in-out-through Digital Synth 100 Rhythms 100 Voices + manual £80. Both – Carr ex. Phone Seon 041-959-7466. Seon Smyth, 20 Talbot Drive, Glasgow G13 3RR. (28)

Philips CM8852 Colour Monitor + Lead for Atari. Perfect Condition Only £75. Buyer collects. 0730 816602 Evenings, Weekends. Also NEC P6 Plus Printer £120. (From Parsons, Sunflowers, School Lane, Stedham, West Sussex. GU29 0NZ. (29)

PageStream v2.1, Unregistered & Unused, a bargain at £80.00. Selling because of acute cash-flow crisis, therefore no offers. Contact: John Weller, 49 Haylett Gardens, Surbiton Crescent, Kingston, Surrey. KT1 2ER. Tel: (081) 546 0993. (28)

Casio FZ Sample Disks – Huge Library of quality sounds – also Sound Patches for most major Synths, with ST loaders. Sale or swap – Ring for details: 1/4 meg Simms (4 of). One Pair Upgrades A 520 STE to 1 Meg. Only £5.00 each. Ring Andy – 0532-430177. (30)

Breaking 520 STFM due to damaged main PCB. Sold complete or individually. Reasonable offers for: Internal Power Supply, Disk Drive, Keyboard (with mouse/JS Sockets), Casing, IC's, Processors etc. Write: K.C.V. 97 Lincoln Road, Fratton, Portsmouth, Hants. PO1 5BQ. (28)

Atari 1040STFM with 2.5mb RAM – SIMMS to 4mb easy, Mono Monitor, 85mb SCSI Hard disk, Second DS Floppy, New Mouse, HP Deskjet Plus, Golden Image Hand Scanner, VIDI-ST Digitizer, Joystick, Pagestream 2, Touch-up, Neodesk 3, Pascal, and C. Ten Games, Mono-Colour Switchbox, Loads of Magazines and disks. Selling to buy Mac. £750 or serious offer considered. Tim Allen:- Dartford. 03220275755. (28)

Games – Lure of the Temptress (Unbugged Version!) £8, Monkey Island £8, Dungeon Master, Chaos Strikes Back, Ultima V, Bloodwych, Operation Stealth, All £6. Originals, or swap for Lemmings, Sin City, Railroad, Tycoon Etc. Gary 0772 745770. (27)

Amstrad SM2400 Autodial Autoanswer 2400 Baud Modem. Manual and Lead included. Good Condition, £60. Tel. (0709) 895707. (29)

Pagestream 2.2 £80, First Word Plus, Hisoft C, Superbase Personal £15 each, Introduction to Word Processing, Basic Programming & Programming Utilities £10 each, P.C.Ditto, Flair Paint £10 each, ST/Amiga Format 2-13, ST Format 1-20,23,26,34-38,40. ST Club Newsletters 15-31, ST Applications 1-4, 9, 14-24, ST User 42 issues March 88 -Present + other ST Mags. 92 Cover Disks in Total, Offers. Phone 0626 654645, Alan. (30)

KSP Read 2 with Manual, Macro Mouse, Professional Icon Designer, Mavis Beacon Teaches Typing. £30.00 ono. Tel Graeme on 09603 69686. (28)

ST Manuals: Calligrapher, Thunder Writer's Assistant, Cashbook Controller, Flair Paint, Hyperpaint, ST Base, Publishing Partner, Atari ST Basic. All £5 each. Phone 031-229-4566. (28)

Portfolio 32K Memory Card, Parallel Interface, File Transfer Software & Lead for ST to Portfolio. All £20 each. Serial Data Switch Box £5, Guide to Timeworks Book £5. Phone 081-851 5942. (29)

Wanted

Could the man from Walton-on-Thames, who offered me the Supercharger PC Emulator, please contact me again. I do want the hardware but I have lost your telephone number! Thanks – Paul. (0308) 24072. (27)

STE 4mb Ram – with/without colour monitor. No other peripherals/software required. Alan 0509-673999. (27)

Calamus 1.09N wanted. Tel Graeme on 09603 69686. (28)

Handbook/any information on BT Modem 4241X. Phone Harry on 0234/22/5307 (day) – 0480/454975 (evenings). (27)

AutoRoute programme for Atari ST. Offers to Cyril Maskery, 6 Parkside, Belper, Derbyshire. DE56 1HY. (0773) 822 832. (28)

Portfolio and 128K Epsom urgently needed. Call Keith Cowling. 05242 62043. (28)

Steinberg Key Expander. Mini Office Presentation Graphics. 0273 502053 (Brighton).

Memory Upgrade for Mannesman Tally MT905 Laser Printer or exchange/sell Font Cartridge J + M for above. Phone Bob 0262 – 671040. (27)

Harlekin 1 manual or a Bridge Game (Mono). A fiver for each? Call Deborah on (0272) 736542. (27)

Reprostudio (with or without Scanner) or Megapaint. Tel Leeds – 665388. (28)

Any DSDD 5.25 inch D/D for STE with PSU and cable. Willing to sell to me for £5? Write to: K Shiraiso, 2 Windsor Terrace, Whitley Bay, Tyne & Wear, NE26 2NS. (27)

General

Does anyone know of any editors/librarians for the Korg Poly 800? – Steve Brown, 14 Arthur Road, Holloway, London, N7 6DR. (27)

3.5" Disks bought and sold. Atari STE bits for sale. Any general Atari queries answered. Phone Ian 0695 579106. (28)

My Little Phoney BBS (0793) 849044 – all speeds up to V32bis and HST. Specialist Atari ST BBS, carrying all Atari-relatedfidonet and Nest Echoes, and importing international ST file echoes (AFN/ADN). High speed and technically aware callers are especially welcome! (R)

Crystal Tower BBS 01-886-2813 24hrs 300-2400 Baud (Towernet System) Atari ST, PC, Languages, Comms etc + much more. All welcome. (R)

Guide Dogs for the Blind Appeal – Please send used postage stamps to help this worthy cause to: 19 Dunloy Gardens, Newton Abbey, Co. Antrim, BT37 9HZ. (R)

STARGATE BBS: 0476-74616 V21 V22 V22BIS V23 Atari ST section; also PC, Amiga and Comms areas. Comms help and advice for ST and PC via ST Editor. Give it a call and leave a message. If you need comms software get Uniterm from the ST Club. (R)

Owing to pressure of space part of the Authorware section has been left out of this issue.
It will return in Issue 28.

Professional typeset from 1st Word disks. Over 100 Faces. Output to high quality PMT. Much better than laser. Also cheap printing A5/A4 single colour. Contact: AZTRAL Games, PO Box 8, Lowestoft, Suffolk, NR32 2AS. (R)

The Confederation BBS – Support bbs for all "HITCHHIKER" software releases and GFA programmers. All the latest PD/Shareware from Europe and USA as well as Netmail message areas. On line each evening 10.00pm to 7.00a.m., at all speeds up to 2400. Give us a call today and you will not be disappointed as we are the most friendly BBS in the country – dedicated ST BBS only. 0533 413443.

Help the Hungry in Africa. Please give your support to those facing drought, hunger and ruin. You can help by sending any old coins, stamps or used stamps to – OXFAM TRADING, Stamp & Coin unit, Murdock Road, Bicestor, Oxon, OX6 7RF. (37)

'Alternaties fanzine – Quarterly. £1 per issue. Issue 9 out now (Autumn), Issue 10 out soon. Send £1 (which includes p+p) and address to Alternaties, 39 Balfour Court, Station Road, Harpenden, Herts, AL5 4XT. Writers, visionaries, artists needed. Details to the above address.

Help

Does anyone have any information on A4 flat bed scanners (greyscale or colour) suitable for use with the ST? I would appreciate make, model details, your views on accompanying software, etc. Also interested in hand-held colour scanners. Write to J. Lucas, 37 Horndean Avenue, Wigston, Leics, LE18 1DP. (27)

Does anyone know how to make 'Mug Shot' (Wizworks) work on a 520 STFM? Also, has anyone got the English Instructions for 'Theme Park Mystery' (Mirrorsoft). Please Contact Mr. G. Ruth, 31 Lander Road, Litherland, Liverpool L32 8HJ. (28)

Can anyone tell me how to print Condensed pitch FWP or ASCII text in sideways ('landscape') format, on A4 or 11" fanfold? Hollings, Flat 5, Park Court, Preston Park Avenue, Brighton, BN1 6HH, or ring 0273 502053. (27)

Contacts

User Groups:- Atari ST Christian User Group. Mutual support in using the ST in all aspects of Church work. Send for our Introductory Disk. Revd. Joe Clemson, 'Woodville', Redesmouth Road, Bellingham, Hexham, Northumberland NE48 2EH. (27)

ST Contacts wanted, interested in music, graphics, assembler, TeX, or just general weirdness. I have a 2.5M STM with colour and mono monitors. Write to Oliver Broadway, Elk Towers, 4 Cadogan Gardens, London N3 2HN. (28)

DTP/Graphics Contacts Wanted – Phone Pete on 021-476 9201 after 6pm. (28)

Does any user of CIRCUIT V2.5 (TRANSISTOR 2) by David Potter written in GFA Basic 2 and dated 18th May 1992 have a contact address for him. Also any users interested in swapping circuits or ideas please write to : Lui, 15 Falcon Road West GFL, Edinburgh. EH10 4AD. (28)

CAD Column

After months without new CAD releases Joe Connor believed the Atari CAD market had been abandoned, and so this month came as a bit of a surprise...

News

Ditek has launched DynaCADD 2D. This is the 2D-only part of the existing combined 2D/3D package. No 2D commands or functions have been omitted. Ditek reasoned that a significant number of users design primarily in 2D and would welcome the new price level of just under $300. Unfortunately, Ditek are currently without a UK distributor, and so if anyone is interested they should contact Ditek directly at:

Ditek International, 2800 John Street, Unit 15,
Markham, Ontario, Canada L3R 0E2.
Tel: Canada (416) 479-1990, Fax: Canada (416) 479-1882

tbxCAD

Another Canadian package, published by tbxEngineering, plopped through my letterbox recently. The cover proclaims 'Champagne CAD at beer prices'. As I prefer a decent glass of beer to champagne I'll reserve further comment for my forthcoming review. By way of a preview here are a few of its more interesting features:

- Infinite drawing plane, limited only by memory
- Bézier curves, ellipses and elliptical arcs
- Snap tools; including tangent, centre, on, intersection, relative to
- 254 layers, with associated layer commands
- Output to GEM Metafile for DTP use
- Menu-driven user interface with movable pop-up menus

tbxCAD will run on any Atari computer from a 520ST to a TT in high resolution.

Circuit Designer

This home-grown product has been released by the author, Darren P Goodwin, to speed up circuit board drawings.

Circuit Designer V1.1a is a pixel-orientated package which produces Degas-compatible output. According to Darren this version includes many enhancements over the previous version, including A5 manual, revamped user interface, with dialog boxes, help line and improved block handling.

Circuit drawings are constructed using a combination of the tools in the Options drop-down menu and the standard symbols selected from the Symbol screen, activated by pressing the right mouse button. The Symbol screen is itself in Degas format, and so custom screens of alternative Symbols can easily be added. The included Symbol screen comprises standard electrical components but another screen consisting of PCB layout components such as solder pads and track styles could easily be added. Snap tools work particularly well with electronic design because components are regularly spaced; the Circuit Designer snap tool was smooth in operation and accurately aligned components.

The Component menu provides special tools. The IC option presents a dialog box to generate DIL ICs with between 6 and 60 legs. The similar multi-way switch option generates the required number of switch contacts.

An elementary Icon Editor can be activated from the Icon Editor menu option enabling a library of icons to be built up and used via this option. I suspect most people would prefer to use their favourite Degas-compatible Art package to create and save Degas blocks and Icons or even create their own custom Symbol screens. It would be useful if these screens could be loaded in as Symbol libraries.

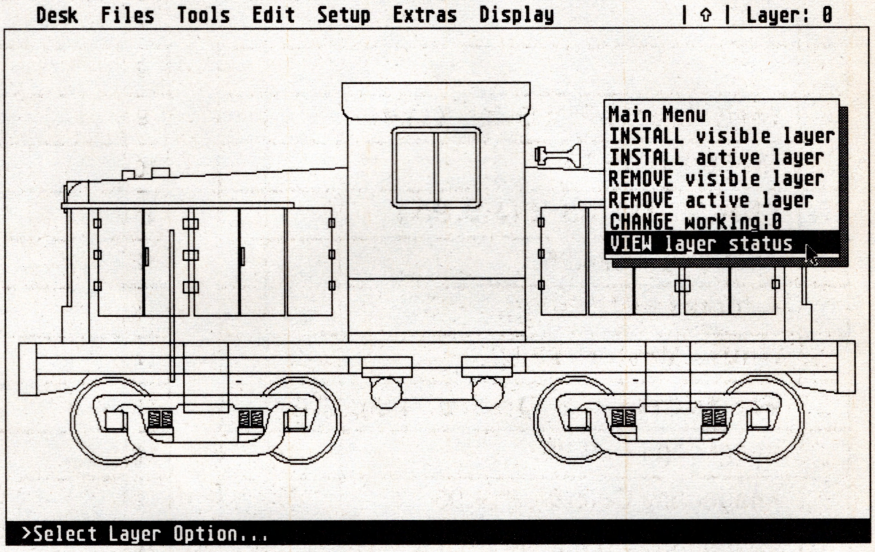
The Print option did not work with either my SLM804 laser or Star 24-pin dot matrix, but as output is in Degas PI3 format designs can easily be exported to another application for final printout.

Circuit Designer runs in monochrome only on all ST/STE models and can be purchased for £7.00 from:

4 Coniston Drive, Bolton on Dearne, Rotherham, S. Yorkshire S63 8NE.

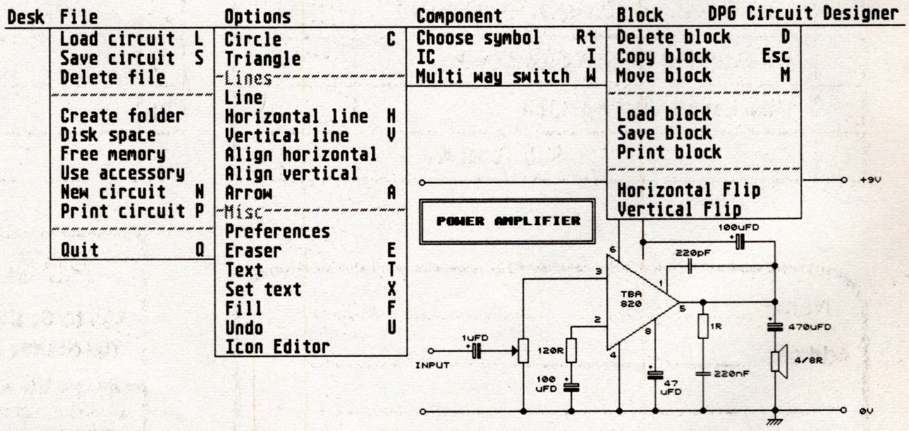
Please contact me directly with any questions regarding the products mentioned in this column:

65 Mill Road, Colchester, Essex CO4 5LJ
Tel/Fax: 0206 851488
Email: jconnor@cix.compulink.co.uk

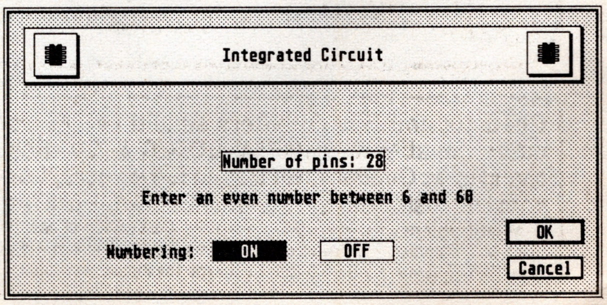

Desk
Files
Tools
Edit
Setup
Extras
Display
| ⇧ | Layer: 0
Main Menu
INSTALL visible layer
INSTALL active layer
REMOVE visible layer
REMOVE active layer
CHANGE working:0
VIEW layer status

>Select Layer Option...

△ The tbxCAD user inteface is clean and uncluttered without an icon in sight. The screen can be panned in any direction by moving the mouse pointer onto one of the four drawing screen edges. The pop-up menus move around the screen with the mouse pointer until an option is selected.


Desk
File
Load circuit L
Save circuit S
Delete file
Create folder
Disk space
Free memory
Use accessory
New circuit N
Print circuit P
Quit Q
Options
Circle C
Triangle
-Lines-
Line
Horizontal line H
Vertical line V
Align horizontal
Align vertical
Arrow A
-Misc-
Preferences
Eraser E
Text T
Set text X
Fill F
Undo U
Icon Editor
Component
Choose symbol Rt
IC I
Multi way switch W
Block
Delete block D
Copy block Esc
Move block M
Load block
Save block
Print block
Horizontal Flip
Vertical Flip
DPG Circuit Designer
POWER AMPLIFIER
+9V
100uFD
220pF
TBA 820
1uFD
INPUT
120R
100 uFD
47 uFD
1R
220nF
470uFD
4/8R
0V

△ An on-screen help prompt for each menu option appears in place of DPG Circuit Designer as menu options are selected. To use an accessory during a Circuit Designer session select the 'Use accessory' menu option.


Integrated Circuit

Number of pins: 28

Enter an even number between 6 and 60

Numbering: ● ON ○ OFF

▷ This Circuit Designer dialog box can produce DIL ICs to order; simply enter the desired number of legs and the IC appears under the mouse pointer ready for placement.

ORDER FORM

• Commercial Software •
• Books • Accessories •
• Disks and Boxes •

Qty	Title	Price	
	ST Applications Subscription (£15)		
	ST Applications + Disk Mags (£22.50)		
	Fonty Calamus Font Editor - £11.95		
	Multiprint - £9.95		
	Mouse Tricks 2 (£9.95)		
	X-Debug - £24.95		
	Address - £12.95		
	Mouse Master - £9.95		
	Redacteur 3 Demo' 75p	Mono/ Colour	
	Imagecopy - £9.95		
	Imagecopy Colour - £14.95		
	Imagecopy Colour Upgrade - £4.95		
	Fontkit Plus 4 - £24.95		
	Fontkit Plus 4 Upgrade (£8.95/£10.95)		
	Disk Boxes for 12 disks (£1.40 each)		
	Un-Branded Double Sided Disks		
	Disk Labels @ 1.5p each		
	Sub Total A = £		

PD & Shareware Disks

	Code (AAA NN)	Title / Description
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		

Name: ______________________

Address: ______________________

____

____

Post Code: ______________________
(This is essential)

STA27

Cheques and Postal Orders should be crossed and made payable to: **SIMPLE LOGIC & Co.** Following changes by Girobank, we can no longer accept payment from UK customers by Transcash or Giro Bank Transfer.
Overseas orders welcome - please see Air Mail prices in our Overseas Price List. Overseas customers may pay by PostGiro to our Account: 37-820-7806. There is now a £3 (bank) charge for these payments.

PD & Shareware disk prices

Up to 6: £1.45 each	**6+ Disks: £1.25 each**
10+disks: £1.00 each	**25+ disks: £0.85 each**

Budgie UK disks are licenseware - not PD - and cost £2.95 or £3.95 ea. - please use the left hand column to order these disks.

___ PD Disks @ £__.__=		
Plus Sub total A =		
Plus 50p P&P on orders below £5		
TOTAL ORDER VALUE		

Subscription to start with current issue / issue no. .....

☐ All prices include VAT • Our VAT No: 432•2334•90
Please tick here if you require a VAT Invoice

Accessories

Unbranded Disks
Guaranteed and from known manufacturers, usually Kao or Sony. Supplied with labels.
10 - £5.00
50 - £22.50

Branded Disks
Guaranteed 3.5" DS disks
- Top quality boxed with labels
- Sony branded or equivalent

Box of 10 - £9.95

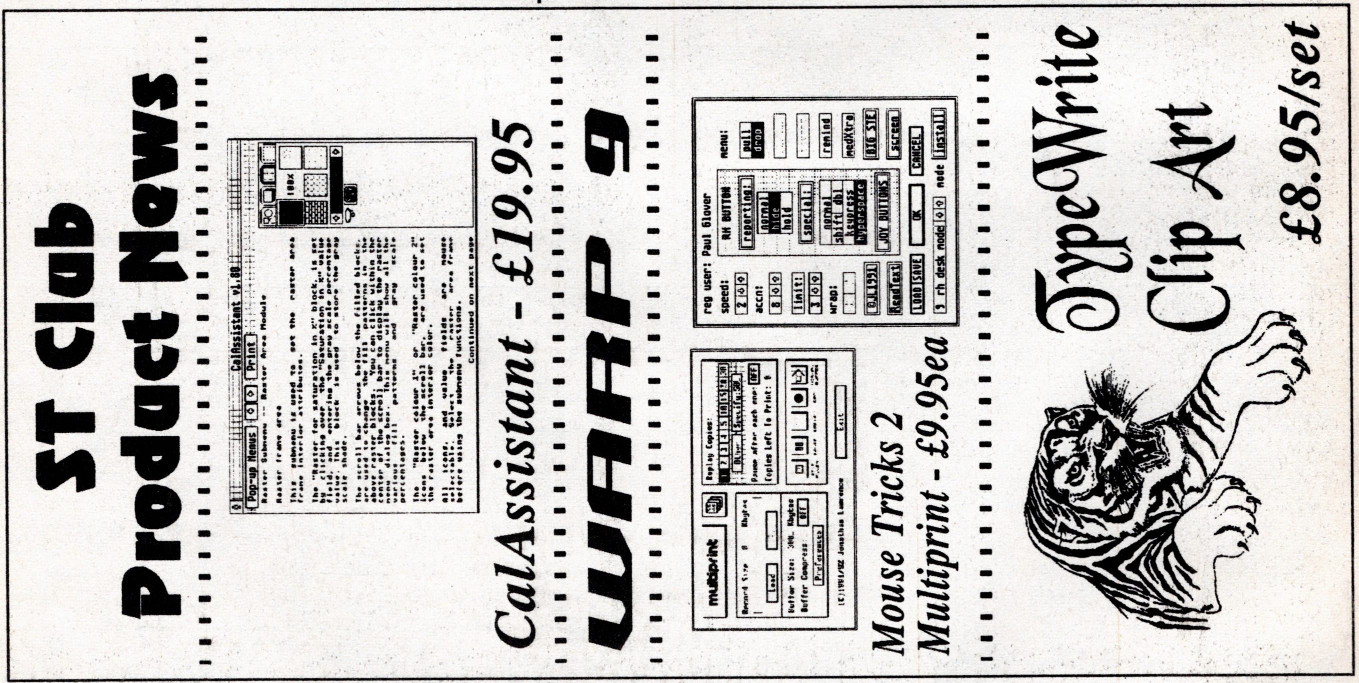
Disk Labels
Coloured Labels - 1.5p each
500 Sprocket Fed White Labels - £9.50

Disk Boxes
Slimpack box for 12 disks - £ 1.40
Box for 40 disks - £ 5.95
Box for 80 disks - £ 7.45
Posso stackable file for 150 - £22.95

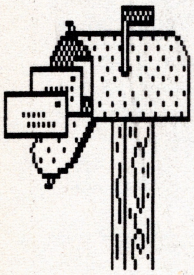
Classified Advertisement Copy

Please insert the following advert for .... Issues under the following classification: / ST Contacts / For Sale / Wanted / General / User Groups. Adverts are free to ST Applications subscribers.

Warning: It is illegal to sell unauthorised copies of commercial software - All software offered for sale must be in the original packaging with manuals etc. Anyone found to be selling pirated software through the classified advert listings will be reported to the appropiate authorities. Software publishers do not normally offer user support or upgrades to users of software purchased second hand.



Use this space for any feedback you'd like us to read.



ST Repairs

Our Service department can repair ST's in minimum time at competetive rates. We can arrange for courier pickup and return delivery of your machine to ensure it's safety. We even have a same day service which will ensure your machine is given priority and subject to fault, completed the same day. We can fit memory upgrades, PC Emulators, Security devices, ROM upgrades, hard drives to Mega STE's etc.

We offer a Quotation service for £15 for which we will examine your machine and report back with an exact price for repair. If you do not wish to go ahead with the repairs then just pay the £15. However if you do go ahead then the charge is included in the minimum charge. Please note: The minimum charge covers labour, parts are extra.

Quotation	£	15
Min repair charge	£	35.25
Courier Pickup	£	11
Courier return	£	6
Same day service	£	15
STFM(E) PSU	£	39.99
1Mb Internal drive	£	39.99
A/B Boot switch	£	4.99

Printers

Star SJ48 Bubblejet	£210
Star LC-20 dot matrix	£124
Star LC-100 colour dot matrix	£165
Star LC-24/100 dot matrix	£179
Star LC-24/200 dot matrix	£209
Star LC-24/200 colour d/m	£259

All Star dot matrix printers include 12 months on site warranty. Add £3 for Centronics cable.

STE Packs

520STE	£229
1Mb 520STE	£239
2Mb 520STE	£274
4Mb 520STE	£320
New- 8833MKII colour monitor with Lotus challenge 2	£189.99
Cable for ST/STE please specify	£9.99

Data Pulse Plus

The Data-Pulse range has recently been re-designed. The Data-Pulse Plus range now offers a more compact case that cuts down on noise even more, all ports are marked, an extensive range of software utilities are now included and our range of special offer utilities has been expanded confirming our commitment to future support. We are continually improving the quality and price/performance ratio of our drives. We have recently incorperated the MAXTOR hard drive mechanisms which offer low power, cached 11ms access time, 127Mb formatted capacity, 150,000 Power on hours mean time between failures and all for a lower price than our old 105Mb drives.

☑ All drives are formatted/partitioned and tested ready to "plug in and go".
☑ Extremely low noise.
☑ Fully Autobooting and Autoparking.
☑ DMA device selector & On/Off switch on front of case.
☑ DMA Out port for daisy chaining extra drives/Laser printer.
☑ Full metal case measuring 300mm x 285mm x 51mm (wdh), providing good shielding and monitor stand.
☑ High quality ICD boards including on board clock and controller software.
☑ All drives include Vault archiver, Backup software, Virus killer, MCP shell program, Midistudio Master demo.

Data-Pulse Plus 40Mb ICD	£	289.99
Data-Pulse Plus 52Mb ICD	£	319.99
Data-Pulse Plus 80Mb ICD	£	379.99
Data-Pulse Plus 127Mb ICD	£	429.99
Data-Pulse Plus 213Mb ICD	£	539.99
HD Turbokit	£	4.99

Data Pulse Plus 20 Mb Floptical

The New Data-Pulse Plus Floptical drive, is a 3.5" SCSI mechanism, ICD host adaptor, high quality Data-Pulse Plus case and psu. The drive is capable of storing over 20Mb of data on a single 3.5" Floptical disk and can also read 720K and 1.44Mb 3.5" floppy disks. The average access time is just 65ms and the data transfer rate is 200K per second, 6 times faster than floppy disks. The floptical is available either as a stand alone unit or as an upgrade to new and existing Data-Pulse(Plus) users where it would be ideal for fast data backup from hard drive.

20Mb Floptical	£439.99
20Mb Floptical disk	£24.99
Floptical Upgrade to Data-Pulse (Plus) HD	£319.99
Diamond Back II	£29.99

New Unlimited Storage capacity

Aries Upgrades

The Aries Upgrade board is an in house designed, Multi layer board utilising high density ZIPP RAM chips. The board has been designed to allow progressive upgrading from the base 512K up to 4Mb. The board does require some soldering but once installed is very reliable. The board is hand assembled in our workshops by skilled technicians and is fully tested before despatch. It also comes complete with fitting nstructions and test software. Our technicians can fit the board to any ST for a small fitting charge. We can arrange courier pickup and return to ensure fast turn araound. A same day fitting service is also available. Please phone for further details of courier and same day service.

Aries Upgrades (any ST(F)(M))

512K Aries board	£	39.99
2Mb Aries board	£	79.99*
4Mb Aries board	£	129.99*
Courier pickup	£	11
Courier return	£	6
Fitting charge	£	15
Same day charge	£	15

Please check the configuration of your machine before ordering.

** = Special offer*

Data-Net

Data- Net is a high speed network solution developed in house at Ladbroke Computing for the ST/STE. Ladbrokes Data-Net hardware consists of an unobtrusive cartridge which plugs into the cartridge port of your ST/STE and connects via Coaxial cable and BNC connectors. The Data-Net hardware is fully Lantech compatible and can be used with Universal Network software.

The Universal Network software is a Multi tasking network package which does not tie up the server whilst drive or printer accesses take place. It allows the sharing of Hard drives and Centronics printers anywhere on the Network. Nodes can also Auto boot accessories from a host's hard drive.

NEW PRICE

Data-Net Node Consisting of 1 Datanet hardware node + 1 Universal Network Node software only

£99.99

Silhouette

Silhouette is a bit image and vector graphics drawing program with Auto tracing. The package offers Auto- Tracing, Beziers, B-Splines, High resolution gray scales. Supports FSM-GDOS, requires 1Mb ST or TT High resolution. Imports: IMG, DEGAS, TINY, MacPaint, GEM, SGF. Exports: IMG, GEM(1,3), SGF, DXF, EPS(Postscript).

Only £60

Aries SIMM's

Special Offers

512K SIMM Upgrade for STE

£11.99

2Mb SIMM Upgrade for STE

£47.99

4Mb SIMM Upgrade STE

£92.99

Please check configuration before ordering

The New Falcon 030 £479.99

1Mb RAM, 16MHz 32 bit 68030 processor, 32MHz 56001 Digital Signal Processor, 8 channel 16 bit CD quality DMA sound chip, Microphone input for stereo sound digitising, 65536 colours in 320x200 mode, 256 colours in VGA mode. SCSI II bus, Internal IDE hard drive interface, Multi TOS Multitasking operating system. Phone for VGA monitors, IDE hard drives, SCSI hard drives etc.

The NEW Brush Mouse

☑ *150 Dpi resolution*
☑ *500mm/SEC Tracking speed*
☑ *Switchable between ST/Amiga*
☑ *Opto/Mechanical Mechanism*
☑ *Includes Deluxe Paint ST*
☑ *Direct mouse replacement*

£24.99 with D-Paint **£19.99** without D-Paint

GI Hand Scanner £119.99

The Golden Image Hand Scanner for the Atari ST features a 105mm scanning head, variable contrast control, user selectable scanning resolutions of 100, 200, 300 and 400 Dpi, one letter mode for high contrast B/W images and 3 photo modes for various shades of grey. The high quality hardware is backed up by two of the most respected graphics packages around. Migraph's Touch Up for scanning and editing hi-res and grey scale images and Deluxe Paint art package for lower resolution colour.

☑ 100, 200, 300, 400 Dpi scanning resolution
☑ 105mm scanning head
☑ 1 letter mode, 3 photo modes
☑ Includes Touch Up
☑ Includes Deluxe Paint

Scanlite: *is an accessory which allows the scanning and saving of files whilst your favourite editor or DTP package is running. The accessory supports Golden Image, Migraph, GeniScan and DAATAscan Hand Scanners.* **£20**

GI External drive £54.99

The Golden Image External 3.5" Floppy drive for the Atari ST features 720K formatted capacity, double sided double density, Through port compatibility for older ST/STM machines, external PSU.

☑ 720K Formatted capacity
☑ New Low price (no track counter)
☑ External Power Supply
☑ Daisy Chain Through Port

GI Optical Mouse £24.99

The Official Golden Image Optical Mouse is a high quality, 3 button, replacement mouse. The fully optical mechanism means no moving parts and offers far higher reliability than opto/mechanical mice.

☑ 250Dpi, 500mm/sec tracking speed
☑ Fully Optical
☑ Mouse mat included
☑ Switchable ST/Amiga

GI Mouse

The Golden Image Opto/Mechanical Mouse offers 290 Dpi resolution, 2 Microswitched buttons for greater reliability and crisper, more positive resonse, Anti-static silicone rubber coated ball. Also includes mouse mat.

Only £14.99

Jin Mouse

Don't be deceived by the low price of this mouse. Mass production of the Jin mouse has resulted in a high quality Opto/Mechanical mouse featuring 290 Dpi resolution, 500mm/sec tracking speed, Anti-static silicone rubber coated ball.

Only £9.99

Ladbroke Computing International

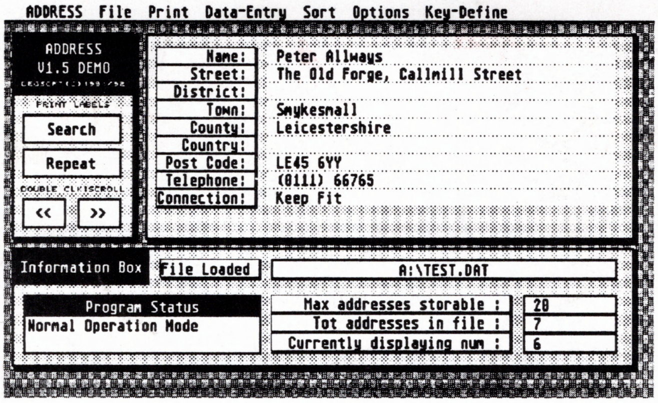
Ladbroke Computing International are the longest established Atari dealer in the U.K. We have developed an extensive customer service policy which involves testing of all Hardware prior to despatch to ensure that goods arrive in working order, offering free advice and support over the phone and keeping cutomers informed. Although our prices are not always the cheapest we do endeavour to offer consistently good service and backup. All prices correct at copy date 28/09/92 (while stocks last), and are subject to change without prior notice. All prices include VAT but exclude delivery. Add £5 for next working day courier delivery, add £10 for Saturday courier delivery (mainland U.K only). Add £3 for postal delivery, only on items under £50 (check with staff before ordering). All prices available on Mail Order, Shop prices may differ. Shop/Mail order premises: 33 Ormskirk Road, Preston, Lancs, PR1 2QP. Open Mon-Sat 9:30am-5:00pm. Phones answered from 9:00am. Ladbroke Computing International is a trading name of Ladbroke Computing Ltd. BFPO addresses overseas, deduct 17.5% VAT and add normal U.K carriage.

Telephone (0772) 203166 FAX (0772) 561071

Address v1.6

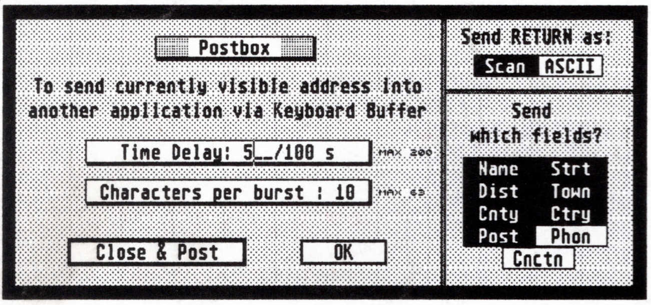
Dedicated Address and Telephone Book

Full GEM-based address book program with fully configurable label printing, telephone lists, and envelope printing options. Good search and sort facilities. Comes with Address.Acc - which gives window-based access to the database when in other GEM programs. ACC will time telephone calls, send addresses directly into wordprocessor documents, has definable printer macro buttons, and lots more.



Name: Peter Allways
Street: The Old Forge, Callmill Street
District:
Town: Smykesnall
County: Leicestershire
Country:
Post Code: LE45 6YY
Telephone: (0111) 66765
Connection: Keep Fit

A:\TEST.DAT
Normal Operation Mode
Max addresses storable : 20
Tot addresses in file : 7
Currently displaying num : 6



To send currently visible address into another application via Keyboard Buffer

Time Delay: 5__/100 s MAX 200

Characters per burst : 10 MAX 65

Features:

- Store as many addresses in the file as your disk/memory will allow and have as many different files as you wish.
- Easily update, delete or add new addresses.
- Sort the address book by a two-field sort system to put the addresses into any specific order required.
- Use the Function keys as preset keywords, such as commonly used town name to speed up ADDRESS entry.
- Auto load an address file when the program is loaded.
- Print out addresses onto envelopes.
- Print out on labels - 1, 2, or 3 across the web. Label layout is fully configurable. You choose which addresses to print by using the Search feature.
- Produce a telephone list.
- Dial telephone numbers with a modem.
- Keyboard short cuts for most menu options, making the program a breeze to use.
- With the accessory you can call up an address whilst in any other GEM application (eg. to print out addresses or telephone someone).
- In the accessory you can use the in built timer to time a telephone call and keep a running total of call charges.
- In the accessory you have the printer macro buttons - 12 programmable buttons you can define to select different features on your printer. You are not limited to just Epson printers.
- 'Flying Default' feature in the accessory means that the Return key changes its use according to what is the most likely next choice.

degsoft
software

Price, complete with two printed manuals:
£12.95

The ST Club
2 Broadway
Nottingham
NG1 1PS

X-Debug

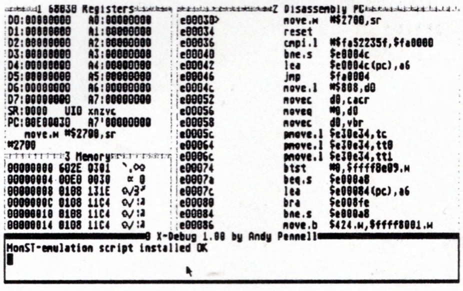
Advanced Debugger for Atari ST/TT computers

X-Debug is an advanced debugger for the Atari range of computers. It is both a low-level debugger, showing memory dumps and register contents, and also a medium-level debugger, understanding about certain high-level languages and allowing source display single-step, and local variable access, for example.

The best support is for Lattice C, as that is the only compiled language that outputs full debug information, but it also supports line-number debug (as created by HiSoft Basic and Devpac 3), and symbol-only debug (usable with virtually all ST compilers).

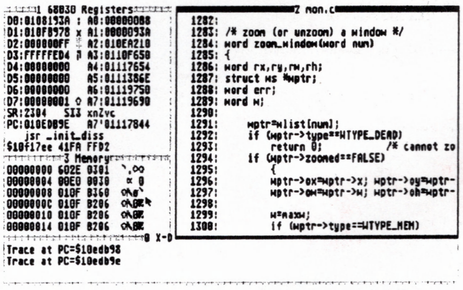
Crucial to the whole debugger is the X-Debug language. This is a simple yet powerful script type language that allows complex operations to be built up from a sequence of standard operations. It supports a full expression evaluator, aliases, and procedures with parameters. It is also an important factor in customising the user interface, allowing specific commands to be attached to particular keypresses.

X-Debug runs on STs and TTs with any monitor type. One megabyte of RAM is recommended, and TOS 1.4 or later avoids problems with larger programs. Written by Andy Pennell, the creater of MonST.



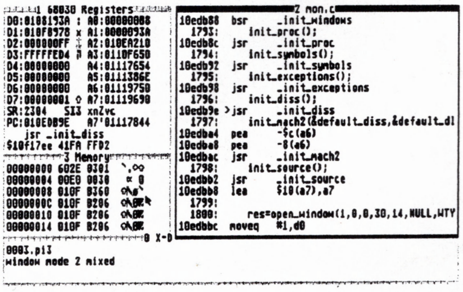
```
D0:00000000   A0:00000000      e00030>   move.w  #$2700,sr
D1:00000000   A1:00000000      e00034    reset
D2:00000000   A2:00000000      e00036    cmpi.l  #$fa52235f,$fa0000
D3:00000000   A3:00000000      e00040    bne.s   $e0004c
D4:00000000   A4:00000000      e00042    lea     $e0004c(pc),a6
D5:00000000   A5:00000000      e00046    jmp     $fa0004
D6:00000000   A6:00000000      e0004c    move.l  #$808,d0
D7:00000000   A7:00000000      e00052    movec   d0,cacr
SR:0000   UID xnzvc            e00056    moveq   #0,d0
PC:00E00030   A7'00000000      e00058    movec   d0,vbr
   move.w #$2700,sr            e0005c    pmove.l $e30e34,tc
#2700                          e00064    pmove.l $e30e34,tt0
                               e0006c    pmove.l $e30e34,tt1
00000000 602E 0301  `.∞        e00074    btst    #0,$ffff8e09.w
00000004 00E0 0030   ∝ 0       e0007a    beq.s   $e000a8
00000008 0108 131E             e0007c    lea     $e00084(pc),a6
0000000C 0108 11C4             e00080    bra     $e008fe
00000010 0108 11C4             e00084    bne.s   $e000a8
00000014 0108 11C4             e00086    move.b  $424.w,$ffff8001.w

MonST-emulation script installed OK
```



```
D0:0108193A : A0:00000088      1282:
D1:010F8978 x A1:0000093A      1283: /* zoom (or unzoom) a window */
D2:000000FF   A2:010EA210      1284: word zoom_window(word num)
D3:FFFFFED4   A3:0110F650      1285: {
D4:00000000   A4:01117654      1286: word rx,ry,rw,rh;
D5:00000000   A5:0111386E      1287: struct ws *wptr;
D6:00000000   A6:01119750      1288: word err;
D7:00000001 ⇧ A7:01119690      1289: word w;
SR:2304   SI3 xnZvc            1290:
PC:010EDB9E   A7'01117844      1291:     wptr=wlist[num];
   jsr _init_diss              1292:     if (wptr->type==WTYPE_DEAD)
$10f17ee 41FA FFD2             1293:         return 0;          /* cannot zo
                               1294:     if (wptr->zoomed==FALSE)
00000000 602E 0301  `.∞        1295:         {
00000004 00E0 0030   ∝ 0       1296:         wptr->ox=wptr->x; wptr->oy=wptr-
00000008 010F B360             1297:         wptr->ow=wptr->w; wptr->oh=wptr-
0000000C 010F B206             1298:
00000010 010F B206             1299:         w=maxw;
00000014 010F B206             1300:         if (wptr->type==WTYPE_MEM)

Trace at PC=$10edb98
Trace at PC=$10edb9e
```



```
D0:0108193A : A0:00000088      10edb88  bsr      _init_windows
D1:010F8978 x A1:0000093A        1793:     init_proc();
D2:000000FF   A2:010EA210      10edb8c  jsr      _init_proc
D3:FFFFFED4   A3:0110F650        1794:     init_symbols();
D4:00000000   A4:01117654      10edb92  jsr      _init_symbols
D5:00000000   A5:0111386E        1795:     init_exceptions();
D6:00000000   A6:01119750      10edb98  jsr      _init_exceptions
D7:00000001 ⇧ A7:01119690        1796:     init_diss();
SR:2304   SI3 xnZvc            10edb9e >jsr      _init_diss
PC:010EDB9E   A7'01117844        1797:     init_mach2(&default_diss,&default_dl
   jsr _init_diss              10edba4  pea      -$c(a6)
$10f17ee 41FA FFD2             10edba8  pea      -8(a6)
                               10edbac  jsr      _init_mach2
00000000 602E 0301  `.∞          1798:     init_source();
00000004 00E0 0030   ∝ 0       10edbb2  jsr      _init_source
00000008 010F B360             10edbb8  lea      $10(a7),a7
0000000C 010F B206               1799:
00000010 010F B206               1800:     res=open_window(1,0,0,30,14,NULL,WTY
00000014 010F B206             10edbbc  moveq    #1,d0

0003.pi3
window mode 2 mixed
```

£24.95

The ST Club
2 Broadway
Nottingham
NG1 1PS